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# Tie the Knot or You Tighten the Noose? The Current Effect of Pre-marital Cohabitation on Marriage Survival Rates

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## THE CURRENT EFFECT OF PRE-MARITAL COHABITATION ON MARRIAGE SURVIVAL RATES

SUBMITTED TO

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Thanks and Love to my Grandmother.

My brother, family, friends, and adviser

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## I. INTRODUCTION

A far cry from the Hollywood of 1950—memorably depicting married couples sleeping in separate beds—contemporary America has begun to embrace quite an opposite cultural norm, that is, unmarried couples sleeping in one bed. Cohabitation outside of marriage has evolved from an aberrant rarity to a prevailing practice, with over 50% of those under the age of 30 now electing to share their residence with a sexual partner before—or without—marrying (Brown and Manning (2009)). Yet despite a variety of economic arguments in favor of this practice—whether shared housing costs, potential avoidance of marriage tax penalties, decreased separation costs, or simply information gathering on a potential spouse—empirical literature over the past two decades has suggested that cohabiting with one's partner may actually destabilize subsequent marital arrangements. As recently as 2010, a study by the National Center for Health Statistics indicated a six-percent decrease in marital survival rates over ten years among those who had cohabited, and a 2008 Harvard Business School case cited a 50% increase in divorce among formerly cohabiting couples.[1]

This paper employs Cox survival analysis techniques to thoroughly examine current links between cohabitation and subsequent marital stability, distinguishing itself from previous literature in several ways: First, utilizing two national datasets made available in 2010, this study provides the first serious academic analysis of marriage survival trends over the past decade. Second, while previous literature has limited its focus to marital duration, this paper extends its scope to consider the survival rates of entire relationships during both the cohabitation and/or marriage phase. Additionally, while past literature has relied upon complex screening models to control for innate heterogeneous qualities in the persons observed, this study employs a wide range of understandable control variables to isolate the potential effects of

cohabitation. Finally, the use of multiple datasets provides much needed internal reliability amid a sea of conflicting findings.

Drawing from two national samples, the 1997-2008 National Longitudinal Survey of Youth (NLSY) and the 2006-08 cycle of the National Survey of Family Growth (NSFG), this study enjoys a significant breadth of observations and a considerable depth of available information. With 2,589 marriages since 1995 in the NLSY, and 3,358 of the most recent marriages in the NSFG, this data greatly postdates that of previous studies, which relied heavily on the trends of prior decades.

The results of this study confirm a substantial decline in the correlation between cohabitation and marital instability over the past thirty years. With proper control of other variables, cohabitation is now found to produce a minimal impact on subsequent marriage survival rates—with some nuance. Serial cohabitation (cohabiting with one or more partners besides an eventual spouse) prior to marriage may produce an elevated risk of marital instability, as, to a lesser extent, may cohabiting prior to engagement. Moreover, this study finds that—similar to marriage—cohabiting relationships begun at a later age dissolve at a far lower rate than those begun earlier, and that even taking this into account, such cohabitations transition to marriage at a rate nearly 6 times those begun earlier in life. The possible explanations and implications of the above and other findings are discussed at length in the remainder of the paper.

In **Section II**, this paper will trace the relevant theory and past research as it has evolved over four decades. **Section III** will provide a thorough description of the data and summary statistics as well as the various analysis methodologies. **Section IV** will display

regression results and provide a discussion of the findings, and **Section V** will conclude with implications and opportunities for future research.

## II. BACKGROUND

This paper provides a much needed re-examination of the link between cohabitation and marriage survival rates. While past studies have attempted to provide a conclusive understanding of the effect, the literature has produced wildly conflicting results over time, is dated by the use of marriage figures from previous decades, and in the most recent work of substance, Reinhold (2010), the analysis of pre 2002 NSFG data was marred by systematic errors in the survey data itself. Moreover, these studies have generally failed to study cohabitation as both a potential precursor and/or substitute to marriage through an analysis of its own respective survival rates compared to marriage. While an extensive body of work has attempted to understand both the empirical and theoretical underpinnings of cohabitation and marriage, the results have yet to establish conclusive economic theories of their relation.

### The Becker Model

Traditional economic analyses of marriage once served to provide a rational understanding of this often irrationally formed social unit. Economist Gary Becker (1973) first advanced his theory of marriage as an explicit "market" in which men and women compete for scarce resources, namely desirable spouses. In a subsequent piece, Becker (1977) further delved into both the theoretical and empirical underpinnings of marriage, examining the causes of its formation and dissolution. Arguing that the success of marriage depends largely upon the "search process" undertaken prior to the union, Becker noted that much of the decision to marry depends upon one's expectations for the quality of his or her eventual mate, compared to the

search costs required to continue seeking the ideal partner. Inadequate screening of a suitable mate leads to misinformation about the true characteristics of that mate and consequently higher probabilities of eventual separation. In contrast to theories positing a gradual marital breakdown due to lessened romance or excitement, Becker proposed that most marriages fail largely on account of misinformed expectations about one's partner at the start of the relationship—pegging a median length of failed marriages at 7 years, and noting that 75% of divorces occur within 15 years. In other words, perfect information is more than the requisite of competitive markets; it is crucial to the successful equilibrium of marriage.

Becker (1977) further finds that the risk of eventual dissolution are far greater for those who marry early or become pregnant prior to marriage, adding that individuals who judge their personal marriage prospects to be low may be most inclined to marry early, because even a relatively mediocre marriage offer may seem appealing in comparison to the costs and anticipated payoff of continuing to search, while those optimistic in their ability to attract a high quality match are more inclined to wait and continue sorting through potential partners.

Given the rarity of cohabitation at the time Becker proposed his theory, there is of course great need for updating and revising his hypotheses to address the new realities. Economists such as Wu & Pollard (2000) describe the similarities between cohabitation and marriage: an intimate relationship, shared residence, and at least moderate pooling of economic resources, setting the stage for discussions of why the couples would choose one or over the other (or one as a lead-in to the other), and how this affects their decisions to remain together. The simple search-and-marry model no longer adequately addresses the questions at hand, and thus understanding the way in which cohabitation has fit into the marriage framework is essential.

## Revising the Model & Understanding Cohabitation

Contemporary research has built upon Becker's original foundations regarding the economic models of marriage and divorce as affected by the rising prevalence of cohabitation. Brien, Lillard, and Stern (2006) note that this relatively recent practice allows couples to enjoy many of the benefits of married life with a potential partner, even as they avoid definitively concluding the search process and even as they refrain from entering a marriage with potentially higher separation costs in the event of a mismatch. Smock, Manning, & Porter (2005) go further, largely dispensing with the traditional marriage search model, attributing the final decision to marry to economic circumstance, and implicitly suggesting that the real search process now takes place with respect to the cohabiting decision. Rather than reaching some critical point at which the expected value of marrying exceeds the expected costs of additional search, they argue the marriage decision is reached once financial stability is attained—or as they even venture to posit, once sufficient funds for a proper wedding have been saved.

Tremendous literature exists regarding the potentially adverse effects of cohabitation on relationships. For instance, many couples may find a higher rate of dissolution within cohabitation grounds to invest less of their own resources than they would under marriage. Gemici & Laufer (2010) further propose that in contrast to couples who marry, cohabiters are more inclined to remain comparatively self-sufficient to insure against the risks of eventual separation. Finding statistically significant differences between the labor participation rate of single women and married women, but no difference between single and cohabitating women, Gemici & Laufer suggest that cohabitation induces far less specialization within the household (i.e. one spouse developing earning power as the other manages children and duties within the

home). They support this conclusion further with the finding that cohabitating couples share far closer educational levels, indicating a departure from more traditional patterns of one spouse advancing further in schooling and consequently developing the earnings potential to support both. Likewise, Wu and Pollard (2000) find that in contrast to certain American samples, results from Canada indicate an earning independence effect, in which cohabiting women with higher earnings are more likely to dissolve the cohabiting relationship. Thus, while they find that higher overall household income produces greater stability in cohabiting, paradoxically, women in high-level occupations are less inclined to find their cohabiter a suitable long-term mate. It should be noted, however, that despite these findings and others, papers such Xie et al. (2003) question whether current earnings even affect likelihoods of marriage, and Light (2010) fails to find economic policy incentives—whether tax laws, unilateral divorce, Medicaid expenditures—as statistically significant determinants of relationship longevity, pointing almost exclusively to traditional indicators such as education, children, etc.

## Evolving Empirics

The impact of cohabitating on eventual marriage stability has been studied as early as the 1980s, with Bennett et al. (1988), finding higher dissolution rates among couples who cohabitated prior to marriage than those who marry straight away. Finding an 80 percent higher probability that a marriage will result in divorce if the partners first cohabited, Bennett et al. largely pioneered a subsequently extensive body of literature revealing a sizeable connection between cohabitation and marital failure. Concluding additionally that the length of cohabitation adversely affected marital outcomes—finding a fifty-four percent increase in divorce rates among those who cohabited for three or more years—and positing a weaker commitment to the institution of marriage among cohabiters than non-cohabiters, Bennett et al. provide early

evidence against the merits of premarital cohabitation. Following this research, Teachman and Polonko (1990) similarly find that extended cohabitation adversely effects marriage and that couples frequently transition from cohabitation to marriage in response to social pressures, not increased belief that the match will prove a good one. Carlson (1986) echoed this view among French youth in 1977, in which nearly twice the number of individuals considered marriage to be the product of such pressure and only half as many viewed it as the result of the partners wishing to solidify their bond. These findings held consistent in the United States, as Axinn and Thornton (1992) likewise found greater numbers of cohabiters accepting divorce as a solution to marital difficulties.

Despite a wave of early research pointing to an adverse effect arising from cohabitation upon future marital success, subsequent studies called into question whether such a connection was actually causal or merely incidental. Booth and Johnson (1988) had put forth a hypothesis that cohabiters might simply over-represent the pool of "poor marriage material," and that the decision to cohabit depended upon the intrinsic qualities of the individuals. Lillard (1995) thus analyzed the impacts of cohabitation, controlling for a proposed self-selection bias within the community of those who cohabit, and found that the factors most likely to predict marital failure in any case (e.g. single parent upbringing, poor emotional health, lower educational attainment, etc) were largely the same as those predicting a decision to cohabit. Thus, he proposed that the perceived connection between cohabitation and marital problems arose from a biased sample in which those *already* most prone to marital failure were the ones self-selecting into cohabitation. Tach (2009) likewise found little relationship between initial cohabitation and the eventual happiness of married couples when controlling for the presence of pre- or non-marital births.

Liefbroer and Dourleijn (2006) furthered this research by analyzing the recent cohabitation rates in Europe, finding a connection between cohabitation and marriage only in cases in which cohabitation remained a rare precursor to eventual marriage. Their findings built upon the notion that as cohabitation has become more mainstream, indeed now the chosen route of the majority of Americans, the self-selection biases of past research should have begun to work themselves out. Reinhold (2010) attempts to verify just this, studying the results of the National Survey of Family Growth in 1988, 1995, and 2002, finding evidence that the correlation between cohabitation and eventual marriage failure has weakened. Despite these findings, however, the lingering impact of cohabitation on marriage remains an open question, as Tach (2009), Kamp et al. (2003), and other recent sources all note an enduring uncertainty. Additionally, even Reinhold (2010), along with Kennedy and Bumpass (2008) admit that the 2002 NSFG data they use is systematically biased by errors made in the reporting of answers, and both call for analyses of more reliable and recent data. With the release of the latest cycle of the NSFG in May of 2010 and new data from the NLSY97, this study provides just that.

## III. DATA & METHODOLOGY

To provide the most reliable analysis of the effect in question, the current paper utilizes two separate data sources, cycle 7 of The National Survey of Family Growth (NSFG) and the 1997-2008 National Longitudinal Survey of Youth (NLSY). This most recent cycle of the NSFG provides a nationally representative sample of men and women aged 15-44 interviewed between 2006-2008. Initially developed to track fertility rates across demographics in its earliest cycles, the NSFG has expanded into a comprehensive questionnaire detailing family histories, educational and ethnic backgrounds, religiosity, and marriage and cohabitation histories. Due to

the more detailed questions regarding cohabitation and marriage histories among women, male respondents were excluded for the present study, leaving 7,356 females in the dataset, 3,358 of whom were ever married.

Retrospective questions regarding dates of marriage, cohabitation, and divorce provide the framework for the current study. Additionally, extensive control variables given in **Table 1** help isolate the correlation between cohabitation and marriage independent of other factors. The variable "lived together" simply denotes whether a couple cohabited pre-maritally, and "engaged" denotes whether the couple was engaged when they began cohabiting. "Devout" provides a binary variable assigned a value of 1 for respondents who consider religion "important" or "very important" in their lives. "Both parents" describes whether or not the individual grew up in a two parent household. "Multiple cohabitations" and "multiple partners" are also recorded as binary variables and are given a value of 1 if the individual has cohabited and/or had sexual relations with more than one partner prior to marriage. "Births" records the timing of the respondents' first child, differentiating between the different relationship stages.

**Table 1: NSFG Descriptive Statistics**

| Variable | Yes | | No | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Lived together | 1,777 | 52.9% | 1,582 | 47.1% |
| College grad | 934 | 27.8% | 2,424 | 72.2% |
| Devout | 1,794 | 53.4% | 1,564 | 46.6% |
| Catholic | 942 | 28.0% | 2,416 | 72.0% |
| Hispanic | 773 | 23.0% | 2,585 | 77.0% |
| Black | 431 | 12.8% | 2,927 | 87.2% |
| Both parents | 2,091 | 62.3% | 1,267 | 37.7% |
| Husband married before | 470 | 14.0% | 2,888 | 86.0% |
| Rural | 694 | 20.7% | 2,664 | 79.3% |
| Multiple cohabitations | 435 | 13.0% | 2,923 | 87.0% |
| Multiple partners | 2,044 | 60.9% | 1,314 | 39.1% |
| Marriage pre 1995 | 1,222 | 36.4% | 2,136 | 63.6% |
| Divorced | 931 | 27.7% | 2,428 | 72.3% |
| Cohabiters | | | | |
| Engaged | 989 | 55.7% | 787 | 44.3% |
| Births | | | | |
| No child | 492 | 14.7% | | |
| During cohabitation | 280 | 8.4% | | |
| In wedlock | 1,726 | 51.6% | | |
| Before cohabitation | 848 | 25.3% | | |

| | Obs. | Mean | Std Dev. | Min | Max |
|---|---|---|---|---|---|
| Year Married | 3,336 | 1997 | 6.75 | 1978 | 2009 |
| Marriage Age | 3,336 | 23.38 | 4.66 | 15 | 42 |

| % of Marriages Surviving | | | # of Cohabitations Lasting | | | |
|---|---|---|---|---|---|---|
| By Year | Never Cohabited | Cohabited | Months | Freq. | Percent | Cum. |
| 1 | 96% | 96% | 0-6 | 322 | 18.3% | 18.3% |
| 3 | 88% | 89% | 6-12 | 301 | 17.2% | 35.5% |
| 7 | 76% | 73% | 12-24 | 450 | 25.7% | 61.2% |
| 12 | 69% | 63% | 24-36 | 251 | 14.3% | 75.5% |
| 20 | 57% | 50% | 36 + | 426 | 24.3% | 100% |

The NLSY97 likewise provides an extensive wealth of data, with a sample of 8,983 youth surveyed annually from 1997-2009 who were aged 12-16 at the first round, including 2,589 who ever married. This data set has both several advantages as well as limitations. First, given the longitudinal construction of the survey, respondents were interviewed annually rather than only once at the close of the period, providing reliably accurate month specific data regarding marital and cohabitation statuses. Additionally, given its focus on an extremely young cohort, the NLSY surveys only those individuals whose adolescence occurred within the most recent time period, providing the desired focus on only the most recent interaction between cohabitation and marriage. Furthermore, both males and females provided the same detailed information with respect to marriage and cohabitation histories, allowing for an analysis not limited by gender (for comparison purposes with the female-only NSFG data, the dataset is restricted to female respondents in certain later regression analyses).

To the extent possible, equivalent variables were selected as were available in the NSFG, with the addition of certain information not recorded in the NSFG. Among these are the variables "drug user," a binary variable assigned a value of 1 if the respondent reported using cocaine or other hard drugs in any of three particular years; "parents' income," a measure of total parental income at the start of the survey; and more specific indicators of religious affiliation (Baptist, Mormon, etc.). "Biological parents" is assigned a value of 1 if the respondent grew up with both biological parents in the household and 0 under any other condition; "rural youth" indicates that the respondent lived in a rural setting at age 14; "young mom" indicates whether the respondent's mother had her first child prior to age 19. Due to the lack of an equivalent question as asked in the NSFG, "religious" marks only whether the individual considers religion an important criterion for moral living, not whether the individual

actually considers him or herself particularly devout. Finally, while the young age of respondents is in one respect ideal for analyzing recent trends, it also severely limits the number of marriages which took place more than a few years before the date of interview, reducing the number of observed divorces to 400. This shortcoming is mediated, however, by previous literature demonstrating that the majority of marital failures occur in the 5-7 years immediately following the start of the union. Moreover, even the smaller number of divorces provides enough observations to perform the necessary regression analyses with sufficient statistical power.

Additional limitations of the datasets include restricted access to specific geographic information (allowing an analysis only of whether respondents live in areas considered metropolitan, rural, etc.). Moreover, while income levels are addressed in both datasets, neither provides particularly useful information. The NSFG fails to provide levels of income at the time of cohabitation, marriage, etc., giving only the level at the time of interview. The NLSY does include questions regarding income levels year to year, but high rates of skipping and small variation in the earning power of this extremely young cohort render the information of little help. Parental income brackets are included in the regression analyses for the NLSY as a background control, but this provides an imperfect proxy for economic wellbeing at best (this variable also suffers from a significant number of skipped responses, making it further problematic as a reliable indicator). Summary statistics for the NLSY data are reported below.

**Table 2**: **NLSY Descriptive Statistics**

| Variable | Yes | | No | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Ever married | 2,596 | 29.8% | 6,385 | 71.1% |
| Ever cohabited | 4,171 | 55.7% | 3,318 | 44.3% |
| How 1st cohabitation ended | | | | |
| Marriage | 1,163 | 25% | | |
| Dissolved | 2,432 | 53% | | |
| Not yet ended | 1,004 | 22% | | |
| | | | | |
| **Of Married Couples** | | | | |
| Divorced | 387 | 14.9% | 2,211 | 85.1% |
| Lived together | 1,450 | 55.8% | 1,148 | 44.2% |
| College grad | 641 | 24.7% | 1,957 | 75.3% |
| Drug user | 357 | 13.7% | 2,241 | 86.3% |
| Rural youth | 921 | 35.5% | 1,677 | 64.6% |
| Catholic | 801 | 30.8% | 1,797 | 69.2% |
| Baptist | 539 | 20.8% | 2,059 | 79.3% |
| Mormon | 26 | 1.0% | 2,572 | 99.0% |
| Hispanic | 628 | 24.2% | 1,980 | 75.8% |
| Black | 385 | 14.8% | 2,213 | 85.2% |
| Religious | 1,279 | 49.2% | 1,319 | 50.8% |
| Young mom | 244 | 9.4% | 2,354 | 90.6% |
| Biological parents | 1,354 | 52.1% | 1,244 | 47.9% |
| Multiple cohabitations | 453 | 17.4% | 2,145 | 82.6% |
| Births | | | | |
| No child | 1012 | 40.8% | | |
| In wedlock | 423 | 17.0% | | |
| During cohabitation | 270 | 10.9% | | |
| Prior to cohabitation | 776 | 31.3% | | |

| | Obs. | Mean | Std Dev. | Min | Max |
|---|---|---|---|---|---|
| Parents' income in 1997 | 1,896 | 42,188 | 37,121 | 0 | 346,575 |
| Age married | 2,596 | 22 | 2.6 | 15 | 29 |
| Year married | 2,596 | 2004 | 2.7 | 1995 | 2009 |
| Months married | 2,592 | 39 | 27.9 | 1 | 142 |

**Marriage Survival Rates**

| At Year | Never Cohabited | (Cohabited) |
|---|---|---|
| 1 | 96% | 96% |
| 3 | 86% | 86% |
| 7 | 76% | 74% |

## Regression Methodology

As is customary in statistical analyses of marital duration, the current study performs a survival analysis of marriages over time using a proportional hazard model. Developed in Cox (1972), the model provides the most appropriate tool for analyzing the probability that a failure event will occur at any time T. The Cox hazard model has the form given by:

$$\Lambda\,(t \mid X) = \Lambda_0(t)\exp(\beta_1 X_1 + \ldots + \beta_k X_k) = \Lambda_0(t)\exp(\beta' X)$$

where the probability of failure at any time T is given by 1) a base rate hazard, i.e., the likelihood of failure at any time apart from the effects of control variables, and 2) the multiplicative effect of covariates denoted exponentially. The $b_1 \ldots b_k$ coefficients produced by the model are interpreted as multiplying the probability of failure at T by the value of the coefficient, such that, for example, a coefficient of 1.12 would raise the probability of failure by 12%.

This study differentiates itself by producing a comprehensive analysis in which a variety of approaches and variations are used. I will first use simple models regressing only the effect that living with a spouse prior to marriage has on subsequent survival rates, then add to the model the additional covariates to control for their effects and more accurately isolate the relationship between premarital cohabitation and marital longevity. Time for each observation is calculated from the start of marriage (t=0) through the date of interview or date of marital separation, whichever is soonest, counting of course only those which ended in dissolution as failures. It should be noted that while failure in the present case might be defined as divorce, due to frequent lags in the date of practical marital dissolution until legally concluded divorce, the date of marital *separation* is used as the time of "failure" to provide more accurate results of

relationship longevity. While straightforward and akin to the methods used by past researchers, this first series of regressions improves upon the work of others by utilizing far more recent data.

Next, a more in-depth procedure will extend further to analyze survival trends of entire relationships from the time of first sharing a residence, not simply since the time of marriage. Whether or not premarital cohabitation occurred, and whether or not cohabitation even transitioned to marriage, the longevity of each relationship will be studied to discern the relative differences in each type's survival pattern. I first break respondents into three groups based on cohabitation & marriage behavior:

1. Married without ever cohabiting
2. Married after cohabiting
3. Cohabiting without ever marrying

This breakdown provides a clear framework for capturing the differences in the survival rates of each possible route. By extending beyond the traditional analysis that only observes marriages, this model recognizes that cohabitation and marriage are in many cases substitutes for each other. Therefore, examining the durability of each relationship type provides a more nuanced comparison of their survival rates and allows us to better understand the overall social stability caused by one and/or the other.

To execute this model I perform an additional Cox survival analysis using the same covariates as in the first series of regressions, but with different time and failure values. "Relationship time" captures the total number of months a couple lived together, whether cohabiting and/or married, and failure is measured as the dissolution of the relationship in either the cohabitation or marriage stage.

Finally, a competing hazard model will analyze only cohabitations to study the rate at which they either transition to marriage or dissolve prior to such a state. Developed by Fine and

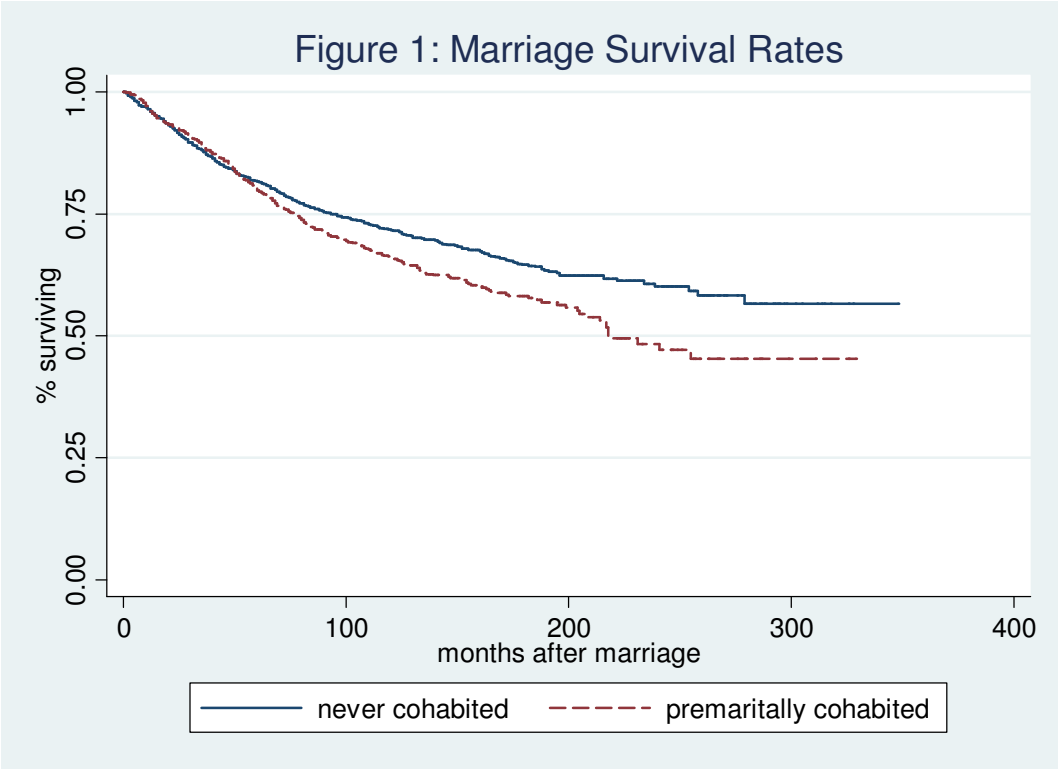
Gray (1999), the competing risk model refines the standard Cox method by accounting for the possibility of multiple types of "failure" events. In the first regression models, dissolution remains the primary event type, with marriage treated as a second possible event outcome that can end cohabitation. This methodology allows for the construction of a more authentic survival function for cohabitations, as it does not automatically exclude any cohabitation that later turns into marriage; rather it simply recognizes that once such cohabitation does transition to marriage, it is no longer to be counted from that point forward. The second specification reverses these two event types, focusing on the rate at which cohabitations transition to marriage, recognizing that once a cohabitation has dissolved it is no longer "at risk" of ending by becoming a full marriage. This likewise is of extraordinary interest, as it allows for the study of cohabitation lengths among those who willfully remain cohabiters without choosing to become spouses. It is this group that perhaps most likely comprises the individuals who see cohabitation as a "substitute" for marriage, and thus allows for a comparison between long term cohabiters and married couples. Obviously these models do little to directly predict the durability of marriages themselves, but given the rising prevalence of cohabitation, it seems useful to understand the relative durability of this now common stepping-stone to, or substitute for, marriage.

## IV. RESULTS

### National Survey of Family Growth (NSFG)

Analyzing only whether a couple lived together prior to marriage, the non-parametric Kaplan-Meier (KM) graph in **Figure 1** illustrates a highly visible disparity between the survival rates of those who did and did not cohabit. As can be seen, while living together prior to marriage is associated with slightly reduced expected hazards for the first years immediately

following a marriage, this effect quickly reverses itself and leads to substantially lower survival rates among those who did cohabit before marriage.




The corresponding Cox regression uses only the "lived together" variable and produces a coefficient of 1.213 with a standard error of 0.08. Statistically significant at the 1% level, the model produces a $\chi^2$ of 8.47 (probability 0.0036). Thus, it seems that before any other factors are taken into account, living together with one's eventual spouse is associated with substantially higher probabilities of marital failure.

In the second regression, I add a series of variables controlling for background characteristics of each respondent. The effect of cohabitation diminishes slightly, falling to 1.209 and remaining highly statistically significant. Immediately several control variables demonstrate statistical significance at the 1% level as well: College graduation produces a coefficient of 0.587, indicating an approximately 40% decline in the likelihood of divorce, and

growing up in a two-parent household lowers the probability 20%. Those who are Catholic, those who are Hispanic, and those who describe religion as important or very important in their lives (those recorded as "devout"), likewise demonstrate reduced risks of divorce, with coefficients of 0.70, 0.72, and 0.73 respectively, again all with strong statistical significance. Those who marry at later ages also demonstrate considerable reductions in the likelihood of divorce, with rates decreasing roughly 6% each year marriage is delayed.

These results are both intuitive and consistent with past research. Divorce rates have long been shown to decrease with higher education, and marriages begun later in life have similarly been known to reduce separation rates (see Axinn and Thornton (1992)), with several potential reasons: greater exposure to a wider pool of potential partners, a smaller likelihood of "drifting" apart as the individuals mature beyond their adolescence, etc. Likewise, having both parents growing up not only provides a model of a successful relationship, but may also greatly contribute to the sense that a durable marriage is the norm, and it likely offers a far more realistic and helpful understanding of what a successful marriage requires, e.g. communication, compromise, etc. (see McGue and Lykken (1992)). The cultural and religious stigmas against divorce within Catholic & Hispanic communities similarly serve to stabilize relationships. Taken as a whole, the model produces a $\chi^2$ value of 298.09 (probability 0.00).

A third regression introduces an additional control: pregnancy history. Breaking respondents into four groups, the "births" variable connects the date of first completed pregnancy to relationship status as follows:

1. No children by the end of first marriage (or interview date if marriage still intact)
2. First child born while cohabiting with husband
3. First child born after marrying husband
4. First child born prior to cohabiting with husband

As can be seen in **Table 3**, there is little change in the impacts of the control variables, yet the effect of premarital cohabitation falls to 1.15 and retains only weak statistical significance at the 10% level. The results for birth categories 2-4 are given as compared to those couples who had no children, and demonstrate high statistical significance for those whose first child came either in wedlock (category 3) or before cohabiting with an eventual spouse (category 4). With a coefficient of 0.71, in-wedlock births demonstrate a reduction in divorce likelihood of nearly 30%, whereas a birth which precedes both marriage and cohabitation *increases* the likelihood of divorce as compared to those who do not have any children by nearly the same amount (coefficient 1.29).

The final controls added to the model introduce factors regarding partner history, specifically whether the respondent has had multiple sexual partners prior to marriage, whether she cohabited with another individual besides her eventual husband prior to marriage, and whether her husband had been married before. With these additional controls, the effect of cohabiting with one's spouse is almost completely eliminated, producing a new coefficient of 1.02 and zero statistical significance at any level. Moreover, the only birth related category with an enduring effect is that of in-wedlock birth, which remains significant with a coefficient of 0.69. In contrast, marrying a husband for whom the relationship is his second marriage increases the rate of divorce by a coefficient of 1.34, and having multiple sexual partners does likewise with an even greater coefficient, 1.62—both significant at the 1% level. Thus, it appears that even in this recent marriage cohort, where over 2,000 of the 3,358 respondents reported multiple sexual partners before marriage, such behavior remains rather dramatically correlated with a higher rate of divorce—indeed far more so than cohabitation.

| VARIABLES | (1)<br>_t | (2)<br>_t | (3)<br>_t | (4)<br>_t |
|---|---|---|---|---|
| lived together | 1.213*** | 1.209*** | 1.152* | 1.020 |
| | (0.0807) | (0.0873) | (0.0870) | (0.0788) |
| college grad | | 0.587*** | 0.649*** | 0.683*** |
| | | (0.0573) | (0.0644) | (0.0686) |
| age married | | 0.935*** | 0.925*** | 0.911*** |
| | | (0.00948) | (0.00950) | (0.00989) |
| devout | | 0.734*** | 0.755*** | 0.777*** |
| | | (0.0516) | (0.0532) | (0.0547) |
| Catholic | | 0.695*** | 0.710*** | 0.731*** |
| | | (0.0612) | (0.0630) | (0.0651) |
| Hispanic | | 0.716*** | 0.726*** | 0.810** |
| | | (0.0691) | (0.0706) | (0.0802) |
| black | | 1.065 | 0.925 | 0.968 |
| | | (0.112) | (0.0993) | (0.105) |
| both parents | | 0.796*** | 0.820*** | 0.843** |
| | | (0.0553) | (0.0572) | (0.0592) |
| year married | | 0.969*** | 0.967*** | 0.968*** |
| | | (0.00590) | (0.00592) | (0.00598) |
| husband married before | | | | 1.344*** |
| | | | | (0.126) |
| rural | | 0.951 | 0.927 | 0.897 |
| | | (0.0753) | (0.0735) | (0.0713) |
| multiple cohabitations | | | | 0.875 |
| | | | | (0.106) |
| multiple partners | | | | 1.615*** |
| | | | | (0.133) |
| birth while cohabiting | | | 0.767 | 0.753* |
| | | | (0.131) | (0.128) |
| birth during marriage | | | 0.709*** | 0.694*** |
| | | | (0.0852) | (0.0835) |
| birth prior to cohabitation | | | 1.285** | 1.162 |
| | | | (0.163) | (0.150) |
| Observations | 3,343 | 3,343 | 3,331 | 3,331 |

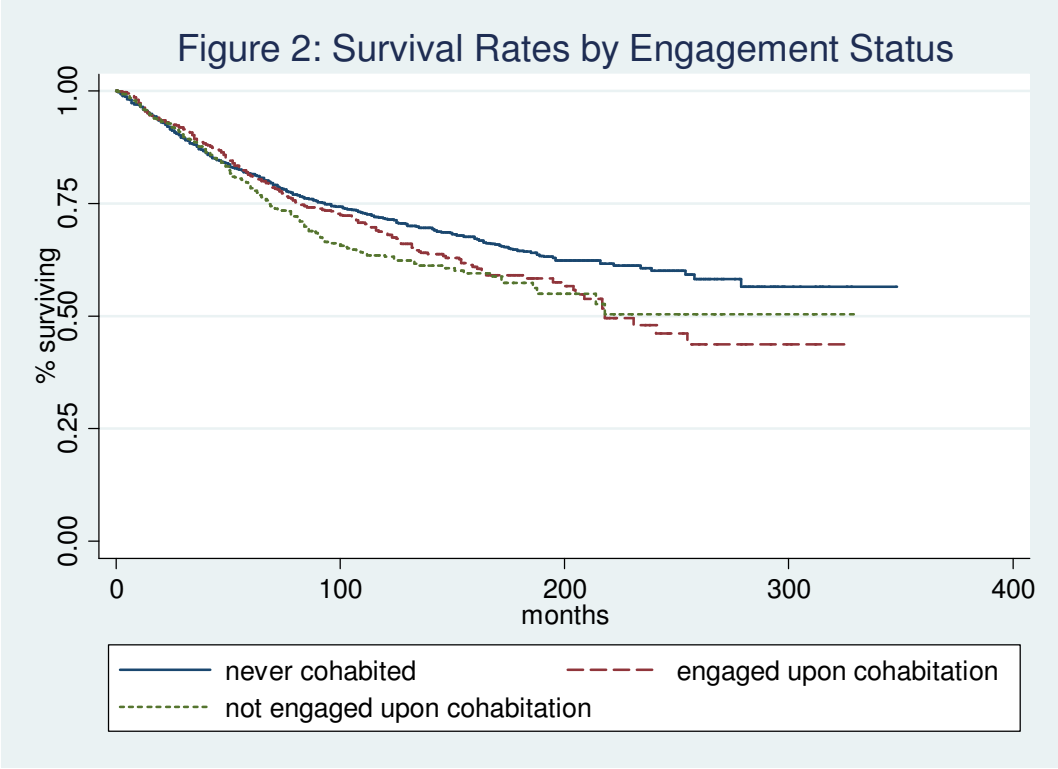
seEform in parentheses

*** p<0.01, ** p<0.05, * p<0.1

While the above regression model indicates a negligible effect of cohabitation on marital longevity once other factors have been controlled, the data given in the NSFG allows for an additional dimension to be analyzed with respect to premarital cohabitation: engagement status at

the time of initial cohabitation. Replacing the "lived together" variable with a new variable, "engaged," I utilize the same control variables as above to determine whether a difference exits between those who were and who were not engaged at the time cohabitation began. Engagement category 1 denotes having cohabited with a spouse after engagement, whereas category 2 refers to those who cohabited without/prior to engagement. The coefficients of each remain relative to those respondents who did not cohabit.

**Figure 2** again uses a non-parametric KM graph to chart the survival rates of the three categories and illustrates a decline in marital stability primarily for those who cohabited without being engaged. After a slightly elevated survival pattern in the years immediately following marriage, those who cohabited and were engaged begin to do slightly worse than those who had not cohabited, though as shown in the subsequent regression outputs, this difference is statistically insignificant.[2]



As seen in **Table 4** below, the first Cox regression produces a statistically significant effect only with respect to those who cohabited without an engagement (coefficient 1.21), whereas engaged cohabiters demonstrate no elevated risk of divorce.

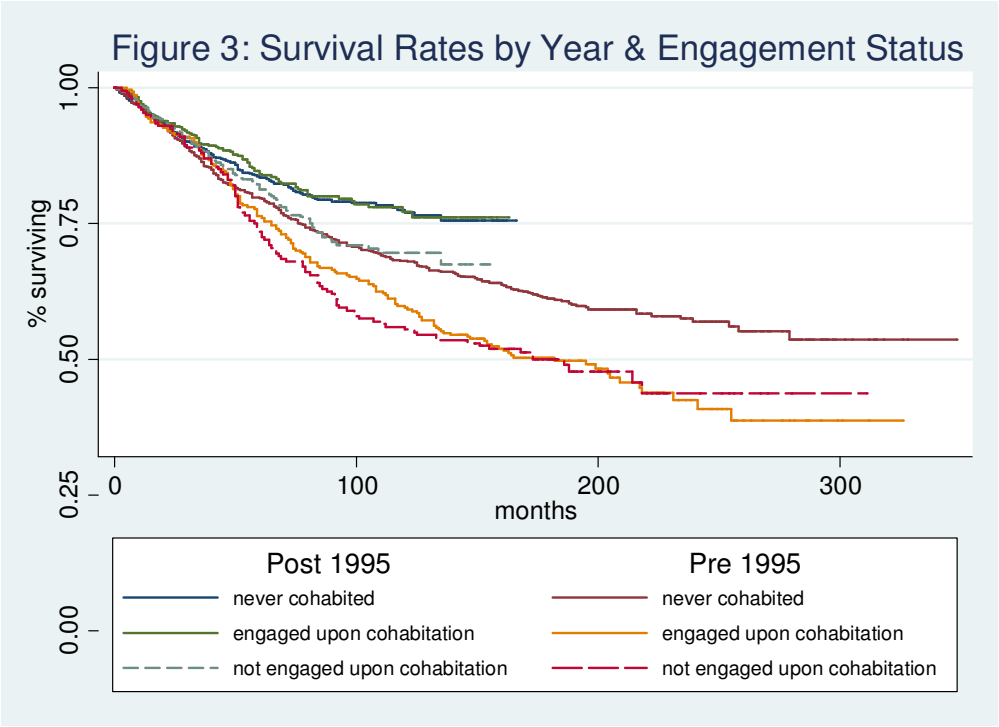
| VARIABLES | (1)<br>_t | (2)<br>_t |
|---|---|---|
| cohabit, engaged | 1.073 | 0.973 |
| | (0.0910) | (0.0835) |
| cohabit, not engaged | 1.211** | 1.101 |
| | (0.114) | (0.105) |
| college grad | 0.676*** | 0.683*** |
| | (0.0676) | (0.0685) |
| age married | 0.917*** | 0.910*** |
| | (0.00964) | (0.00990) |
| devout | 0.757*** | 0.782*** |
| | (0.0535) | (0.0552) |
| Catholic | 0.723*** | 0.735*** |
| | (0.0643) | (0.0654) |
| Hispanic | 0.726*** | 0.806** |
| | (0.0708) | (0.0798) |
| black | 0.964 | 0.966 |
| | (0.104) | (0.105) |
| both parents | 0.817*** | 0.843** |
| | (0.0570) | (0.0592) |
| year married | 0.968*** | 0.968*** |
| | (0.00595) | (0.00599) |
| husband married before | 1.374*** | 1.339*** |
| | (0.129) | (0.126) |
| rural | 0.918 | 0.897 |
| | (0.0729) | (0.0713) |
| multiple cohabitations | | 0.866 |
| | | (0.106) |
| multiple partners | | 1.614*** |
| | | (0.133) |
| birth while cohabiting | 0.762 | 0.741* |
| | (0.130) | (0.127) |
| birth during marriage | 0.710*** | 0.691*** |
| | (0.0853) | (0.0832) |
| birth prior to cohabitation | 1.269* | 1.154 |
| | (0.162) | (0.149) |
| Observations | 3,331 | 3,331 |

*** p<0.01, ** p<0.05, * p<0.1

The second regression, in which partner history is re-added, produces a diminished effect of cohabitation for both categories of engagement, such that the coefficient for the unengaged cohabiters remains higher than the engaged, but statistical significance is shed there as well.

While the effects of cohabitation continue to appear small after controls, therefore, it remains of great interest to confirm whether such patterns reflect a change from previous marriage cohorts or a deviation from the findings of past research that did indicate an impact. Thus, an additional set of regressions dividing the respondents by year of marriage splits those who married before 1995 from those marrying after. Not only does this allow for a comparison across time, but the regressions looking only at the post 1995 cohort then align most closely and provide an apt comparison with the data from the NLSY, which itself records only those marriages beginning in 1995.

**Figure 3** provides a comparison graph of those married and cohabiting pre and post 1995, split between the three engagement categories. As can be seen, in the recent cohort, there exists no distinction between engaged cohabiters and non-cohabiters, with a gap arising only among those who cohabited without being engaged. In contrast to this pattern, cohabiters prior to 1995 exhibit substantially lower survival rates regardless of their engagement status prior to marriage. In other words, while avoiding cohabitation may once have been unequivocally linked to lower divorce rates, it now seems that little relation exists, and does so only in cases where cohabitation preceded engagement.




The Cox regression results focusing on time are given below. **Table 5** presents the regression series analyzing only those marriages since 1995. As can be seen, cohabiting with an eventual spouse has no statistical significance in any of the regressions, even as the final configuration produces a $\chi^2$ of 170.94 and retains several of the familiar statistically significant control variables. Thus, while the findings are similar to those of the final model of the full dataset, it is clear that with respect to marriages in the last 15 years, cohabitation lacks any statistically significant impact on marriage even without controls.

| VARIABLES | (1)<br>_t | (2)<br>_t | (3)<br>_t | (4)<br>_t |
|---|---|---|---|---|
| lived together | 1.185 | 1.123 | 1.001 | 0.915 |
| | (0.123) | (0.126) | (0.119) | (0.110) |
| college grad | | 0.502*** | 0.574*** | 0.601*** |
| | | (0.0712) | (0.0835) | (0.0886) |
| age married | | 0.942*** | 0.930*** | 0.917*** |
| | | (0.0122) | (0.0124) | (0.0130) |
| devout | | 0.854 | 0.878 | 0.898 |
| | | (0.0921) | (0.0946) | (0.0968) |
| Catholic | | 0.651*** | 0.664*** | 0.664*** |
| | | (0.0894) | (0.0915) | (0.0915) |
| Hispanic | | 0.792 | 0.785* | 0.866 |
| | | (0.114) | (0.113) | (0.126) |
| black | | 1.026 | 0.898 | 0.916 |
| | | (0.160) | (0.142) | (0.146) |
| both parents | | 0.845 | 0.875 | 0.891 |
| | | (0.0885) | (0.0917) | (0.0938) |
| year married | | 0.931*** | 0.926*** | 0.925*** |
| | | (0.0160) | (0.0163) | (0.0162) |
| husband married before | | | | 1.373** |
| | | | | (0.197) |
| rural | | 1.033 | 1.003 | 0.983 |
| | | (0.128) | (0.125) | (0.122) |
| multiple cohabitations | | | | 0.918 |
| | | | | (0.136) |
| multiple partners | | | | 1.564*** |
| | | | | (0.205) |
| birth while cohabiting | | | 0.927 | 0.878 |
| | | | (0.213) | (0.202) |
| birth during marriage | | | 0.701** | 0.705** |
| | | | (0.125) | (0.125) |
| birth prior to cohabitation | | | 1.386* | 1.250 |
| | | | (0.252) | (0.231) |
| Observations | 2,224 | 2,224 | 2,218 | 2,218 |

seEform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In contrast to marriages since 1995, those occurring earlier present remarkably different findings, as evident in **Table 6**. In a simple regression considering only the "lived together" variable, a coefficient of 1.416 (p<1%) dwarfs the statistically insignificant 1.18 coefficient in the simple model for the post 1995 cohort. When analyzed using the "engaged" variable, the results are equally pronounced. In regression 2, even after the majority of controls are in place, both

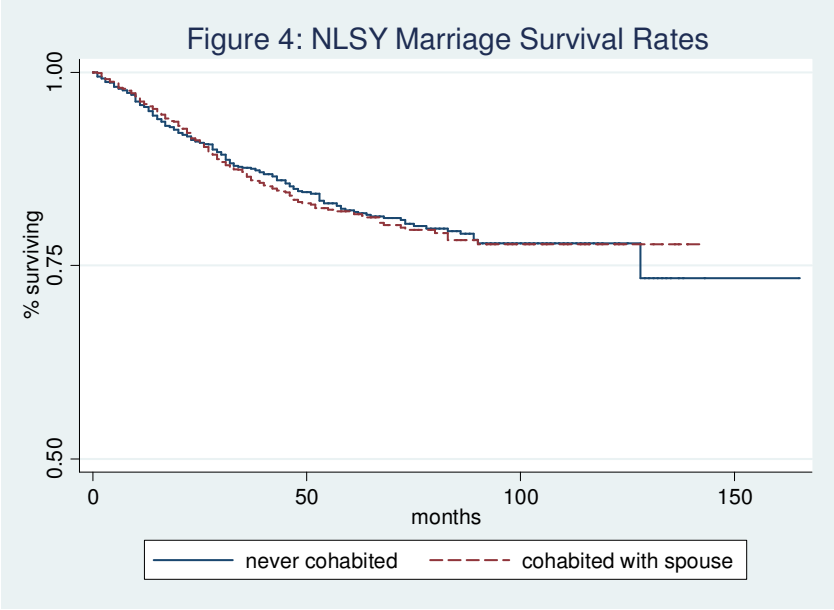
engaged and unengaged cohabiters demonstrate statistically significant increases in marital instability (coefficients of 1.29 and 1.36, respectively). In the final regression, while statistical significance is lost, the coefficients for both groups remain well above those of the full dataset.

| VARIABLES | (1)<br>_t | (2)<br>_t | (3)<br>_t |
|---|---|---|---|
| lived together | 1.416*** | | |
| | (0.120) | | |
| cohabit, engaged | | 1.290** | 1.134 |
| | | (0.137) | (0.123) |
| cohabit, not engaged | | 1.363** | 1.205 |
| | | (0.172) | (0.154) |
| college grad | | 0.763** | 0.782* |
| | | (0.0998) | (0.102) |
| age married | | 0.912*** | 0.900*** |
| | | (0.0151) | (0.0152) |
| devout | | 0.688*** | 0.712*** |
| | | (0.0624) | (0.0645) |
| Catholic | | 0.761** | 0.777** |
| | | (0.0861) | (0.0876) |
| Hispanic | | 0.672*** | 0.767** |
| | | (0.0866) | (0.100) |
| black | | 0.989 | 1.010 |
| | | (0.145) | (0.148) |
| single parent | | 1.184* | 1.136 |
| | | (0.112) | (0.108) |
| year married | | 0.965*** | 0.964*** |
| | | (0.0120) | (0.0119) |
| husband married before | | 1.317** | 1.242* |
| | | (0.163) | (0.154) |
| rural | | 0.862 | 0.827* |
| | | (0.0883) | (0.0846) |
| multiple cohabitations | | 0.734 | 0.697* |
| | | (0.155) | (0.146) |
| birth while cohabiting | | 0.605** | 0.619* |
| | | (0.151) | (0.154) |
| birth during marriage | | 0.657*** | 0.627*** |
| | | (0.106) | (0.101) |
| birth prior to cohabitation | | 1.148 | 1.015 |
| | | (0.204) | (0.182) |
| multiple partners | | | 1.715*** |
| | | | (0.178) |
| Observations | 1,213 | 1,207 | 1,207 |

seEform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

National Longitudinal Survey of Youth (NLSY)

As noted before, the current study benefits from the use on an additional dataset to ensure consistency and validity of findings, an attribute of tremendous importance given the widely conflicting results of past analyses. Moreover, the longitudinal data of the NLSY provides additional depth and accuracy regarding cohabitation and partner status at any given month. Beginning with the same regression as with the NSFG, I first use the simple model accounting only for whether a respondent pre-martially cohabited with his or her spouse. **Figure 4** provides the KM graph of respective marital survival patterns for those who did and did not cohabit with their spouse before marriage. As can be seen, there appears virtually no distinction.




The first Cox regression again starts with an analysis of premarital cohabitation without controls, and with a 0.768 probability of attaining the $\chi^2$ result, a coefficient of essentially 1, and a p value over 10%, it seems even from the simple model that cohabiting is not related to subsequent marital outcomes—a finding consistent with the post 1995 NSFG results above.

In the second and third regressions, I add several other control variables. As with the first models in the NSFG data, a college degree nearly halves the likelihood of divorce with significance at the 1% level. Having both biological parents, a child in the marriage, being of Hispanic ethnicity, and marrying at a later age all produce reduced divorce rates with statistical significance at the 1% or 5% levels as well. While the $\chi^2$ for the model jumps to 132.93 (probability 0.000), the effect of living together prior to marriage remains statistically insignificant with a coefficient of 1. Perhaps the most interesting finding, however, arises from the "multiple cohabitations" variable, however. Statistically significant at the 5% level, cohabiting with at least one non-future spouse prior to marriage increases marital instability by over 30% (coefficient of 1.32). Thus, while the same variable in the NSFG produced statistically insignificant results, it appears from this dataset that cohabiting with multiple individuals correlates with higher divorce rates. A logical explanation for this disparity between the two datasets would seem to be that controlling for "multiple sex partners" as in the NSFG serves as the moderator of the actual impact of "multiple cohabitations." However, even in NSFG regressions that included multiple cohabitations but *not* multiple partners, the variable failed to demonstrate any statistically significant effect.

In the fourth regression, I eliminate multiple covariates for the sake of parsimony (excluding those without statistical significance and replacing "births" with a simpler "wedlock" variable that only records in-wedlock births). As seen in **Table 7**, cohabitation with one's spouse continues to have no impact, while growing up with both biological parents, having a child in wedlock, earning a college degree, delaying marriage and identifying as Catholic all correlate with lower marital instability at statistically significant levels (<5%). Multiple cohabitations likewise retains statistical significance and a sizeable coefficient (1.34).

| VARIABLES | (1)<br>_t | (2)<br>_t | (3)<br>_t | (4)<br>_t |
|---|---|---|---|---|
| lived together | 1.029 | 1.026 | 1.036 | 1.060 |
| | (0.105) | (0.117) | (0.119) | (0.114) |
| age married | | 0.818*** | 0.818*** | 0.830*** |
| | | (0.0212) | (0.0213) | (0.0210) |
| college grad | | 0.511*** | 0.517*** | 0.553*** |
| | | (0.0948) | (0.0958) | (0.101) |
| drug user | | 1.225 | 1.213 | 1.279* |
| | | (0.167) | (0.166) | (0.173) |
| rural youth | | 0.982 | 0.984 | |
| | | (0.111) | (0.111) | |
| young mom | | 1.328* | 1.323* | 1.280 |
| | | (0.203) | (0.202) | (0.192) |
| Catholic | | 0.890 | 0.889 | 0.763** |
| | | (0.122) | (0.122) | (0.0892) |
| black | | 0.736* | 0.734* | |
| | | (0.131) | (0.131) | |
| Hispanic | | 0.660*** | 0.663*** | |
| | | (0.0991) | (0.101) | |
| Mormon | | 0.898 | 0.934 | |
| | | (0.530) | (0.552) | |
| Baptist | | 1.131 | 1.137 | |
| | | (0.151) | (0.152) | |
| birth while cohabiting | | 0.696* | 0.686* | |
| | | (0.138) | (0.137) | |
| birth during marriage | | 0.417*** | 0.416*** | |
| | | (0.0551) | (0.0551) | |
| birth prior to cohabitation | | 0.817 | 0.814 | |
| | | (0.115) | (0.115) | |
| biological parents | | 0.783** | 0.783** | 0.764** |
| | | (0.0859) | (0.0871) | (0.0826) |
| religious | | 0.978 | 0.978 | |
| | | (0.104) | (0.104) | |
| multiple cohabitations | | 1.335** | 1.347** | 1.339** |
| | | (0.190) | (0.192) | (0.184) |
| parents' income < $10,000 | | | 1.118 | |
| | | | (0.186) | |
| $10,000-$20,000 | | | 0.912 | |
| | | | (0.168) | |
| $50,000-$75,000 | | | 0.954 | |
| | | | (0.174) | |
| $75,000+ | | | 0.896 | |
| | | | (0.120) | |
| wedlock | | | | 0.790** |
| | | | | (0.0862) |
| Observations | 2,600 | 2,579 | 2,579 | 2,588 |

*** p<0.01, ** p<0.05, * p<0.1

NLSY Females

In the same way that a final regression in the NSFG data was made to include only marriages after 1995 to more closely match the dataset to the NLSY, I have made a similar adjustment to the NLSY data to ensure its comparability with the NSFG by conducting an additional regression using only female respondents. The results of the regression are displayed below in **Table 8.** As one can see, females, too, fail to demonstrate a statistically significant difference between those who did and did not live with their husbands prior to marriage, though multiple cohabitations, college education, and marriage age continue to correlate with high statistical significance.

| VARIABLES | (1)<br>_t | (2)<br>_t |
|---|---|---|
| lived together | 1.113 | 1.187 |
| | (0.148) | (0.170) |
| age married | | 0.812*** |
| | | (0.0272) |
| college grad | | 0.517*** |
| | | (0.127) |
| young mom | | 1.126 |
| | | (0.227) |
| Catholic | | 0.888 |
| | | (0.132) |
| wedlock | | 0.756* |
| | | (0.109) |
| biological parents | | 0.799 |
| | | (0.115) |
| drug user | | 1.391* |
| | | (0.243) |
| multiple cohabitations | | 1.425** |
| | | (0.246) |
| Observations | 1,469 | 1,463 |

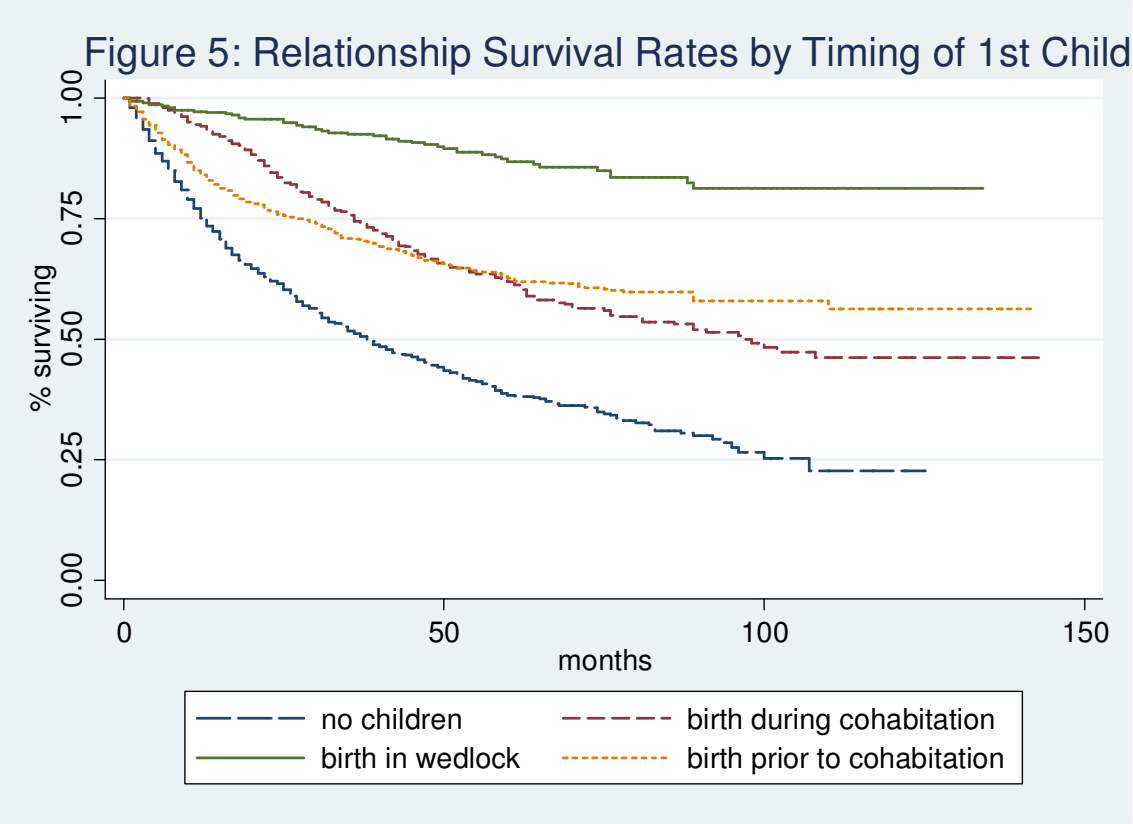
seEform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

## Total Relationship Durations

Having concluded the regressions strictly analyzing marital durability, I turn now to the analysis of first relationships of shared residence of any sort. Given the rise of cohabitation as not only a step *toward* marriage, but also in many cases now as a substitute *for* it, this analysis provides a more comprehensive look at the current state of long-term relationships. Due to the specific month-month data for all cohabiters being available in the longitudinal NLSY, this analysis is restricted to the use of that dataset alone; however, given the overall agreement in the patterns between the NSFG and NLSY results (the "multiple cohabitation" disparity excepted), it appears reasonable to place confidence in findings even without corroboration from the other dataset.

I begin the first regression using generally the same control variables as in the full NLSY analysis, excluding only those which assume marriage and replacing them with their analogous versions for all relationships (e.g. "marriage time" is replaced by "relationship time," "marriage age" is replaced by "relationship age"). As can be seen in **Table 9**, college graduation, having grown up with two biological parents, starting a cohabiting/marriage relationship at a later age, and being Hispanic all correlate with statistically significant drops in the risk of dissolution at any given time. Most noteworthy, however, is the effect of childbirth, which correlates quite strongly with lowered risks across all types. The non-parametric KM graph in **Figure 5**—though it does not account for the other controls—illustrates this point rather strongly. As one can see, marriages with children in wedlock dissolve with by far the least frequency. Those with children born during cohabitation (regardless of whether it led to marriage or not), begin as the second most "durable" relationships, demonstrating a steady drop in survival rates over time. However, after an initially precipitous decline in survival rates, those cohabitations preceded by

a birth eventually stabilize and appear to even overcome those cohabitations where childbirth occurred after the initial decision to cohabit.




While more research would certainly need to be done to verify such findings, one might explain this trend as follows: couples where one or both members have a child (together or with a different partner) are aware of the circumstances of the relationship at the point when they decide to cohabit; thus, while the odds of dissolution are high in the initial "trial" period, if their relationship survives this phase, they are advantaged over category 2 by the fact their relationship is not altered by the introduction of a first child. Caution should be taken with such conjecture, however, as it must be recognized that this pattern arises from the non-parametric KM model, which fails to account for the other controls.

Finally, in the second regression, I reintroduce the overall "relationship type" variables: Type 1 (married without cohabiting), Type 2 (married after cohabiting), and Type 3 (cohabited

without ever marrying), to provide a comparison of the three routes to long-term relationships. These results are translated into their graphical representation in **Figure 6**, which captures the immense disparity between cohabitation and marriage. However, one should be careful to draw too much from such a result for two reasons. First, given that many of the most successful cohabitations turn to marriage, Type 3 suffers from a selection bias in which, for the most part, only the worst relationships remain, as the others transition to Type 2. Additionally, while the intent of marriage is a long-term bond, many cohabiters may have no intention or desire to maintain their cohabitation indefinitely, viewing it as a form of convenience in a more short term relationship. Regardless of the inflated risk in Type 3, however, the disparity even between Type 1 and Type 2 couples provides somewhat conflicting evidence from the results in Section I.

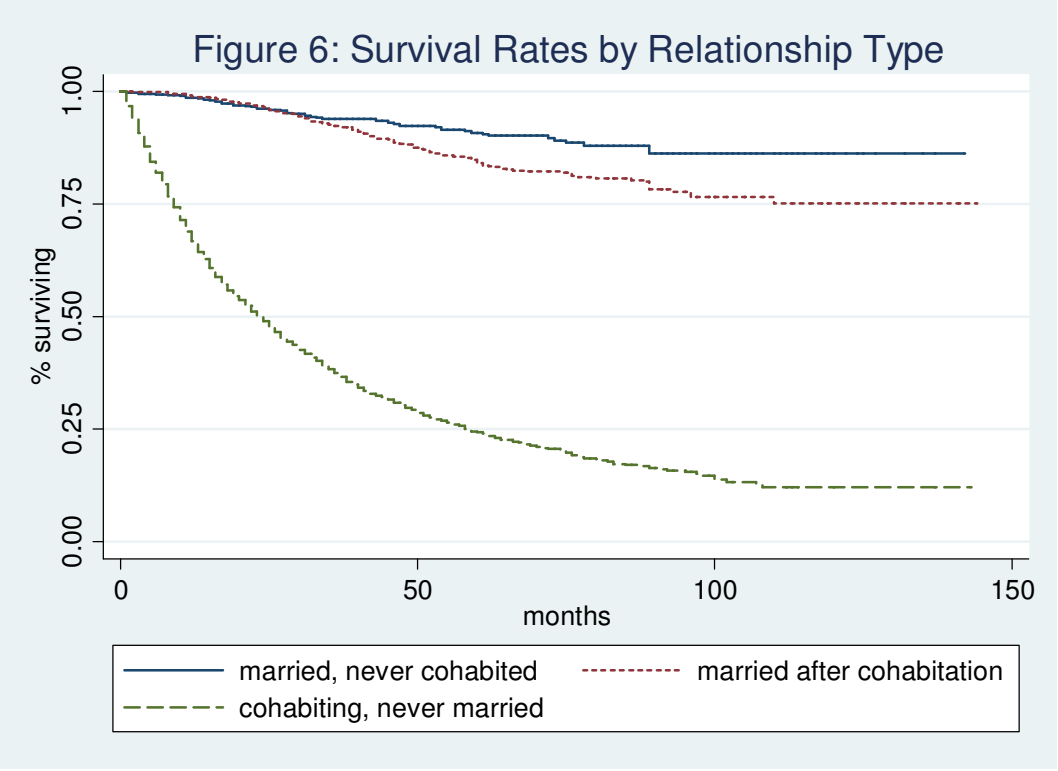



**Table 9** provides the corresponding regression output and a starkly clear difference among cohabiters and married couples. Those who cohabited with an eventual spouse are at a

higher risk of dissolution (coefficient of 1.6) even after controls, and cohabiters who did not transition to marriage are at an exponentially higher risk of dissolution (coefficient 9.5).

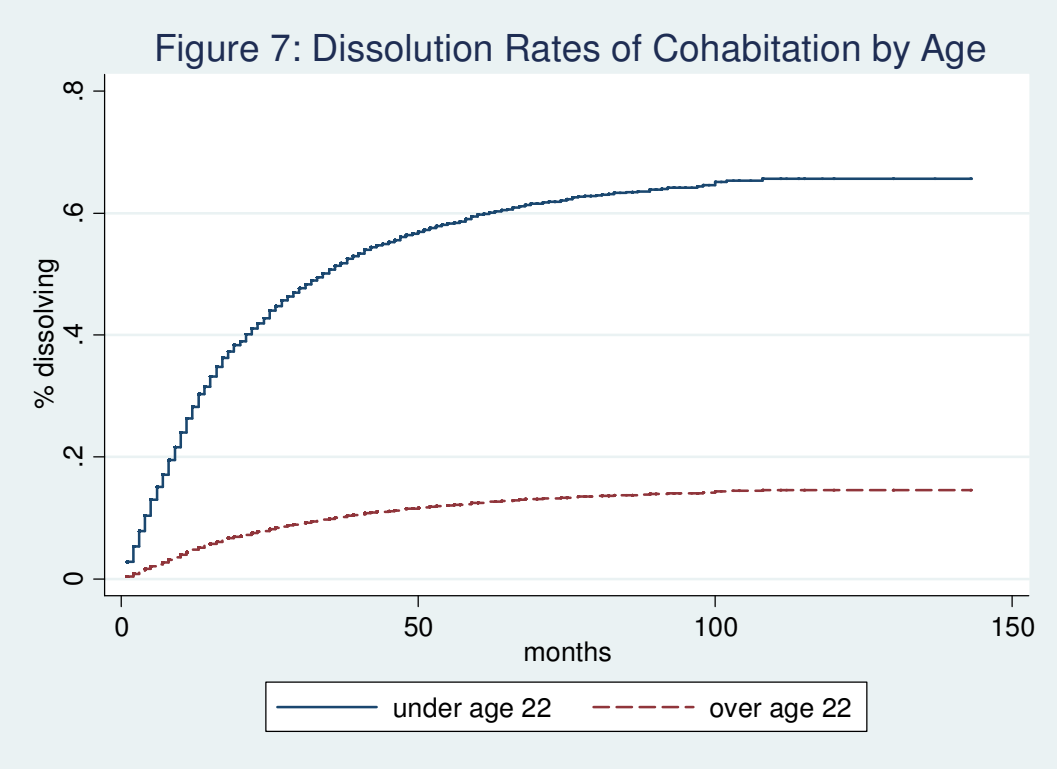
| VARIABLES | (1)<br>_t | (2)<br>_t |
|---|---|---|
| relationship age | 0.831*** | 0.909*** |
| | (0.0233) | (0.0270) |
| college grad | 0.460*** | 0.445*** |
| | (0.0874) | (0.0870) |
| drug user | 1.140 | 0.930 |
| | (0.171) | (0.142) |
| rural youth | 0.993 | 1.024 |
| | (0.118) | (0.123) |
| young mom | 1.363* | 1.485** |
| | (0.223) | (0.248) |
| Hispanic | 0.653*** | 0.651*** |
| | (0.0948) | (0.0957) |
| black | 0.801 | 0.690* |
| | (0.151) | (0.133) |
| biological parents | 0.739** | 0.800* |
| | (0.0872) | (0.0963) |
| religious | 1.052 | 1.153 |
| | (0.120) | (0.135) |
| birth while cohabiting | 0.421*** | 0.413*** |
| | (0.0761) | (0.0754) |
| birth during marriage | 0.443*** | 0.414*** |
| | (0.0748) | (0.0718) |
| birth prior to cohabitation | 0.549*** | 0.665*** |
| | (0.0754) | (0.0990) |
| married after cohabitation | | 1.595*** |
| | | (0.283) |
| cohabiting, no marriage | | 9.522*** |
| | | (1.900) |
| Observations | 2,459 | 2,371 |

seEform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

## Cohabitation Durability & Outcomes

As noted above, the analysis of cohabitation will naturally be biased if those cohabitations ultimately headed for marriage are completely removed from the pool. Thus, in this last section, I provide the results from a competing hazard model which analyzes the rate at which cohabitations either transition to marriage or dissolve prior to reaching such a state.

**Figure 7** provides a graphical representation of the failure rate of cohabitations, divided between those who were at least 22 years old at the start of the relationship and those who were not.




As evident in the cumulative incidence function above, relationship age takes on an enormously significant role within cohabitations. **Table 10** mirrors this result, showing that

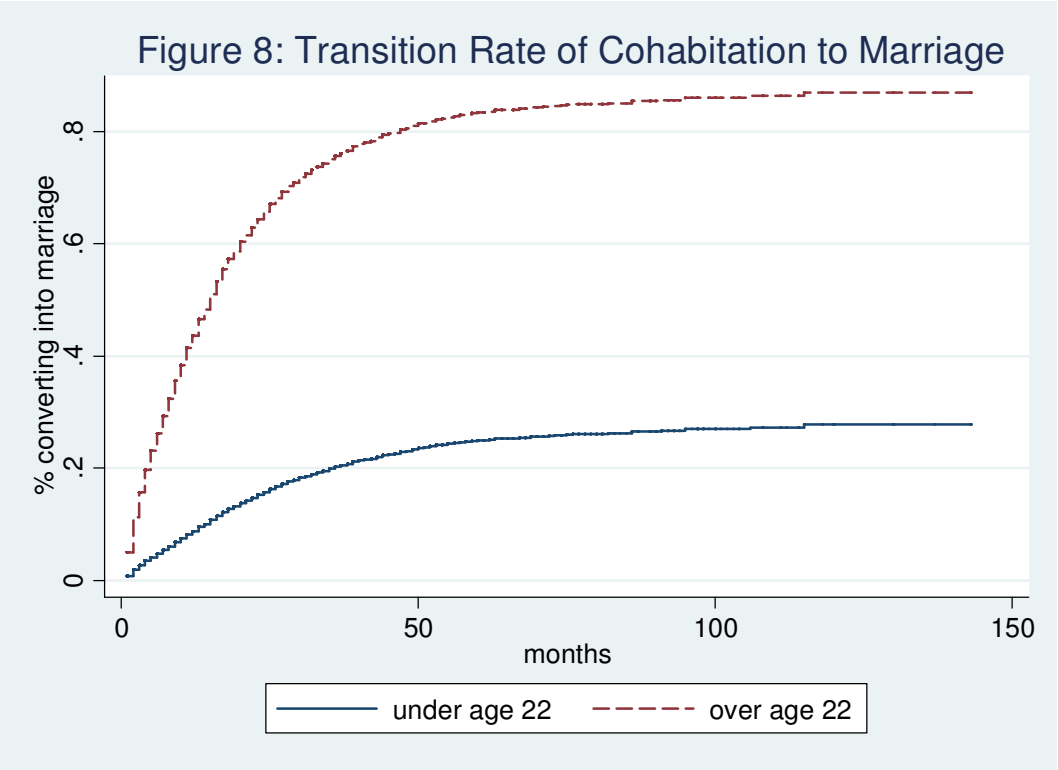
while most of the familiar control variables continue to affect survival rates, age is key. Far more so than with marriages—which themselves are strongly impacted by age at time of marriage—the age at which a cohabiter begins a relationship is paramount to the longevity and survival function of the relationship. When distinguishing between cohabiters above and below age 22 (as in the second regression), the $\chi^2$ not only more than doubles from 217.69 in the first regression to 565.56, but the coefficient for the "over 22" variable produces a reduction in dissolution rates by over 80% with high statistical significance. Additionally, blacks face 50% greater rates of dissolution, drug use correlates with a 15% increase, and delinquency 5%, all with high statistical significance. College graduates and those with children, two biological parents, and/or upbringing in a rural setting all enjoyed lower rates of dissolution. Interestingly, neither being Catholic nor Hispanic produces any statistically significant impacts, indicating that their associated religious or cultural pressures to remain married do not apply to cohabiting.

| VARIABLES | (1)<br>_t | (2)<br>_t |
|---|---|---|
| relationship age | 0.774*** | |
| | (0.0171) | |
| over age 22 | | 0.146*** |
| | | (0.0208) |
| college grad | 0.989 | 0.830*** |
| | (0.135) | (0.0494) |
| drug user | 1.288** | 1.154** |
| | (0.154) | (0.0651) |
| rural youth | 0.923 | 0.880*** |
| | (0.0912) | (0.0424) |
| young mom | 0.998 | 1.043 |
| | (0.147) | (0.0667) |
| Hispanic | 1.120 | 0.988 |
| | (0.149) | (0.0631) |
| black | 1.449*** | 1.581*** |
| | (0.200) | (0.0898) |
| biological parents | 0.982 | 0.839*** |
| | (0.101) | (0.0399) |
| birth during cohabitation | 0.431*** | 0.399*** |
| | (0.0631) | (0.0246) |
| birth before cohabitation | 1.187 | 0.702*** |
| | (0.139) | (0.0412) |
| religious | 0.871 | 0.981 |
| | (0.0830) | (0.0430) |
| Catholic | 0.902 | 0.989 |
| | (0.105) | (0.0525) |
| delinquency | 1.061 | 1.055*** |
| | (0.0411) | (0.0170) |
| parents' income | 1.000 | 1.000 |
| | (1.66e-06) | (7.56e-07) |
| Observations | 1,569 | |

Robust seeform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The second set of regressions traces the probabilities that a cohabiting relationship will transition to marriage at any given point. **Figure 8** graphs the respective rates at which cohabiters marry, again broken down between those older and younger than age 22. In the same

way that younger cohabiters dissolved at a radically higher rate, older cohabiters marry at an exceedingly higher pace than their younger counterparts.




As shown in the first regression results of **Table 11**, relationship age again contributes strongly not only to the survival rates of cohabitations, but to the likelihood that surviving relationships will transition to marriage. Having a child during the cohabitation increases the likelihood of marriage by 20%, a somewhat unsurprising finding given that marriage continues to be seen as the dominant atmosphere to promote stable environments for children. Interestingly, having a child born prior to cohabiting (potentially with a different partner) reduces the likelihood of marriage by 24%, possibly indicating less faith in long-term relationships or simply greater risk aversion toward them. Those labeled religious enjoyed increases of 13% in the rate of marriage, possibly reflecting a pressure to marry from internal feelings or those of their family or religious community.

Regression 2 again distinguishes between those older and younger than 22, and finds that cohabiters over the age of 22 marry at more than six times the rate of those under that age. Moreover, Hispanics and especially blacks remain in the cohabitation stage of a relationship with far greater tendencies than whites, with coefficients indicating reductions in the likelihood of marrying of 22% and 60% respectively, both with high statistical significance.

| VARIABLES | (1)<br>_t | (2)<br>_t |
|---|---|---|
| relationship age | 1.196*** | |
| | (0.0157) | |
| over age 22 | | 6.262*** |
| | | (0.538) |
| drug user | 0.755*** | 0.737*** |
| | (0.0624) | (0.0619) |
| rural youth | 1.095 | 1.163** |
| | (0.0706) | (0.0757) |
| young mom | 0.973 | 0.958 |
| | (0.104) | (0.103) |
| Hispanic | 0.952 | 0.778*** |
| | (0.0891) | (0.0705) |
| black | 0.805** | 0.407*** |
| | (0.0820) | (0.0406) |
| biological parents | 1.000 | 1.149** |
| | (0.0651) | (0.0745) |
| birth during cohabitation | 1.189** | 1.065 |
| | (0.0909) | (0.0875) |
| birth before cohabitation | 0.763** | 0.876 |
| | (0.0806) | (0.0880) |
| religious | 1.128** | 1.268*** |
| | (0.0688) | (0.0777) |
| Catholic | 0.935 | 0.904 |
| | (0.0653) | (0.0642) |
| delinquency | 0.965 | 0.913*** |
| | (0.0276) | (0.0275) |
| parents' income | 1.000 | 1.000 |
| | (9.21e-07) | (8.61e-07) |
| Observations | 1,569 | 4,206 |

Robust seeform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Of the individuals who cohabited prior to age twenty-two, 57% dissolved the relationship, 18% married, and 24% were still together at the time of the final interview round. Of those who had cohabited after age twenty-two, only 12% failed, 87% married, and 1% were still cohabiting at the time of the interview. Thus from these statistics and the regressions above, there emerges a clear finding: the nature of cohabitations at different ages is radically more divergent than it is among marriages. Cohabitations begun at an early age demonstrate almost no chance of long term survival. Those begun later in life demonstrate almost no chance of remaining in the cohabitation stage. The implication seems to be that the practice of cohabiting in fact still serves as a precursor to marriage in the same way dating does. At a young age it is simply part of the search process and is highly unlikely to focus upon a future spouse. At an older age, however, it appears overwhelmingly to be the step toward, rather than a serious substitute to, marriage in all but a minority of cases. Marriage therefore appears to remain the dominant and still largely unchallenged long-term family unit, and one whose survival rates seem generally unaffected by prior cohabitation.

## V. CONCLUSION

Cohabitation has become mainstream in the United States, and its effect on—and relation to—the institution of marriage is a matter of tremendous importance. As this paper has reaffirmed, the formerly substantial correlation between pre-marital cohabitation and marriage survival rates has essentially vanished. Among couples married in the last 15 years, the decision to cohabit produces minimal statistical impacts, especially among those engaged at the time of cohabitation. However, the findings in the NLSY data do suggest a roughly 30% increased risk of separation among those who cohabited with anyone other than an eventual spouse prior to marriage. While further research is needed to help confirm or dismiss this finding, it should

perhaps serve as a caution to those weighing the relative costs and benefits of cohabiting. If this correlation results from a causal effect—for example, that a failed cohabitation reduces one's faith in or commitment to long-term relationships in the future as well—then great care should be taken in selecting a cohabiting partner. If the correlation arises rather from a selection effect, then it might a) serve as a warning sign if one's partner has cohabited previously, indicating potential commitment issues, and/or b) simply correlate with other, equally problematic, behavior (e.g. having impulsively moved out at a young age and thus having had more chance to engage in serial cohabitation with partners). Again, while potentially interesting, this finding appears only in one of the two datasets, and any conjecture remains subject to future research.

Beyond studying the effects of cohabitation on subsequent marital stability, this paper has also analyzed the extent to which cohabitation serves as a complementary antecedent toward, or substitute for, marriage. Given the fundamental role marriage plays in the social and economic organization of society and the rearing of children, and given the current special tax treatment it receives in the United States, its place in society is of great consequence. As the results above indicate, however, marriage seems in far less danger of being replaced or destabilized at the hands of cohabitation than it does by other factors. Cohabiting youth under 22 exhibit high rates of dissolution and low tendencies to marry, appearing to treat cohabitation more akin to dating than as a serious committed relationship that would rival marriage. Cohabiters who are older, on the other hand, transition to marriage overwhelmingly, indicating they see cohabitation as a step to, rather than substitute, for marriage. Likewise, among cohabitations that do not turn to marriage, those begun after 22 appear highly stable in comparison to cohabitations started earlier. Future research will hopefully compare the survival rates of these relationships against those of married unions, so that we might really know how strongly formal marriage reinforces

commitment and stability among intended long-term relationships, and whether cohabitation will serve as a serious competing choice to marriage in the years to come. Indeed, as additional data from the NSFG releases this coming year and more datasets provide sufficient numbers of older cohabiters, we may have answers to these questions rather soon.

Despite the empirical findings on the survival rates of marriage and cohabitation in the present study, it should be noted that these conclusions say nothing about the actual quality or happiness of the relationships. This study addresses only relationship longevity, and one should be careful in concluding that cohabitation is truly without impact on marriage—whether individually or institutionally. As shown in other literature cited above, cohabiters remain far less likely to invest in relationship-specific capital, instead preserving a guarded sense of self-sufficiency. Likewise, the effect of cohabitation on children may prove far more crippling than it does on marriage itself, as new research suggests children in cohabiting households are at 3-4 times the risk of sexual, physical, and emotional abuse, even when raised by biological parents (Wilcox (2011)). Finally, even if these effects on children were to disappear with greater control of other factors (socioeconomic level, etc.), cohabitation may prove simply incapable of fully replicating marriage. By its very nature—bereft of ceremonies, vows, and documentation—cohabitation may leave many future couples with a sense of uncertainty. Surely divorce laws have done much to dislodge the mentality of marriage permanency already, but cohabiters may find themselves forever restlessly weighing the option to stay or leave, forever keeping the proverbial knot loose.

## VI. NOTES

[1] While Harvard Business School Publishing disclaims the use of its cases as "endorsements, sources of primary data, or illustrations of effective or ineffective management," this case serves to illustrate the widespread conception that cohabitation is linked to drastic marital destabilization, and that even the most distinguished sources reinforced this notion as recently as 2008. Both the HBS case and the original Wall Street Journal piece it cites are given below:

Piskorski, Mikolaj, Hanna Halaburda, and Troy Smith. "eHarmony." *HBS Premier Case Collection*. Harvard Business School Publishing. 1 Jul. 2008.

Zaslow, Jeffrey. "Moving on: Divorce Makes a Comeback—Poor Economy, Tense, Times Prompt More Couples to Call it Quits." *The Wall Street Journal*. 14 Jan. 2003, p. D1, Accessed Nov. 2007.

The other source for these figures comes from the *New York Times*, citing the 2010 NCHS study of pre-2002 data:

Roberts, Sam. "Study Finds Cohabiting Doesn't Make Union Last." *The New York Times*. 3 Mar 2010. Accessed 24 Apr 2011. <http://www.nytimes.com/2010/03/03/us/03marry.html?_r=1>

[2] While the survival function of engaged cohabiters appears to fall below that of non-engaged cohabiters after approx. 10 years according Figure 2, this arises not from the un-engaged catching up to the engaged, but from an insufficient number of observations remaining after so much time

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