Relationship transitions among first time cohabitors: predicting marriage or dissolution in a competing risks framework

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ABSTRACT

This study assesses the relative risk of moving into a marriage relationship among cohabiting couples as opposed to dissolution. Exchange theory is used to explore the link between human and economic capital attainment and the likelihood of marriage. Using longitudinal data from the National Longitudinal Study of Youth 1997 we are able assess how both personal and couple level variables affects the competing risks of marriage and dissolution as compared to continuing to cohabit. It was found that income variables did little to increase the risk of marriage; however, not knowing your partner's income had strong effects on the hazard of both marriage and dissolution. It was also found that fertility variables play a large role, with pregnancy increasing marriage risk and decreasing dissolution. Interestingly, having a biological child present decreased the risk of dissolution and this effect grew stronger over time.

Introduction

Non-marital cohabitation is becoming a part of the life course for a large section of the population, with it being estimated that half the population will now experience a cohabiting relationship in their lifetime (Bumpass and Lu 2000). Although cohabitation is becoming normative, the vast majority of adolescents see marriage as the ideal and expects to marry in their lifetime (Martin et al. 2001, Manning et al. 2007). Cohabitation relationships are notoriously unstable, with numerous studies reporting dissolution rates between 40 and 46% (Guzzo 2009, Lichter et al. 2006, Bumpass and Sweet 1989). Thus, we are presented with a quandary; a significant proportion of the young adult population will live in a cohabitation relationship that will not transition to a marriage; even though marriage is still the ideal. This paper draws upon and extends exchange theory as developed by Gary Becker (1973, 1974) to identify and explain different mechanisms that predict a successful transition to marriage amongst young adults who are first time cohabitors.

Studies have long identified negative consequences for cohabiting couples on outcomes such as marital quality (Amato et al. 2003, Kamp Dush et al. 2003) and risk of divorce (Amato et al. 2003, Brines and Joyner 1999, Martin et al. 2001). However, studies that restrict a premarital cohabitation to those who only cohabit with their marital partner have found that the negative impact on marital quality (Teachman 2003) and positive association with divorce disappears (DeMaris and Rao 1992). Studies have also found that couples who transition into marriage experience increases in relationship quality compared with those who remained cohabiting (Skinner et al. 2002, Brown 2004). Thus, there is an interest in studying a person's first cohabitation relationship, as the successful transition to marriage increases current relationship quality and dissolution can have negative effects upon future relationships.

The current study focuses upon young adults in their prime union formation years. I use 13 waves of data from the National Longitudinal Study of Youth 1997 cohort to study first cohabitation relationships and trace the relationship transition, if any, to marriage or dissolution. The use of a longitudinal data set allows the construction of time varying variables, which makes it possible to follow respondents as they experience relationship transitions. The use of competing risks regression analysis also provides a test of the strength of the relationship between the variables and the outcomes over time. This study builds upon previous research by constructing a person month file, which allows precise measures of the timing of couples' relationship experiences.

Exchange Theory

Exchange theory was developed in the seminal work *Social Behavior as Exchange* (Homans 1958) to explain why humans interact with each other on a daily basis, especially in small groups. This was extended to cover dyadic interactions, with people being attracted to others if they expect that interacting with the other will bring benefits to themselves (Blau 1964). Exchange theory has been extended to marriage relationships, with some important modifications. The first is that marriage is a legally binding institution and is invested with a wide variety of social meaning that a friendship is not; that is there are certain barriers to exiting a marriage. General social interactions are not mutually exclusive; one can have many friends, acquaintances and business partners. This is not the case with (most) intimate relationships; there is the expectation that if one is involved with an intimate partner, one is not involved with any others. Therefore, in an intimate relationship a person is faced with the prospect that other

relationships may provide more benefits. Thus, exchange theory, when applied to marriage, involves the conception of attractions, barriers and alternatives (Levinger 1979).

Attractions

Attractions are defined as the rewards of the relationship minus the costs. As it is assumed that every relationship has both positive and negative aspects, it is the balance that drives relationship cohesion (Levinger 1979). People are simultaneously trying to attract partners and predict likely rewards as well. Thus, there is a sorting process, as people try to attract the best mates, but are limited by what they can offer a partner (Becker 1973). This theory was developed by Becker (1973, 1974) in regards to marriage entry and extended to explain dissolution (Becker et al. 1977). People will enter relationships if they believe that the relationship will maximize their personal benefits more than any other possible relationship or if they were to remain single. Benefits include tangible aspects such as wealth, income and domestic labor as well as more intangible aspects such as caring, love and support.

A limitation of this theory is it assumes that people have accurate information on a partner's skills and attributes, yet a young adult's future earning potential is often vague and unpredictable (Oppenheimer 1988). I argue that cohabitation provides an opportunity for couples to accrue and develop economic capital while in a relationship that involves relatively low barriers to dissolution if this potential is not realized. In a marriage, people have two possible outcomes, they can decide to continue a relationship or they can dissolve it. In cohabitation, people have three possible outcomes, they can decide to continue the cohabitation relationship, they can dissolve the relationship, or they can progress to marriage. Using the above formulation, I propose an individual will take steps to marry once the attractions to a relationship become

realized and the individual wants to provide a barrier against dissolution to secure these attractions. Those whose partners continue to exhibit potential will continue to cohabit while those who fail to live up to potential will dissolve their relationship.

This conceptualization can help explain the high rates of dissolution among cohabiting couples. It has been estimated that by the second year 34% of unions have dissolved, with 34% marrying and 32% continuing in a cohabitation relationship (Lichter et al. 2006). Other estimates include 32% married and 20% dissolved (Smock and Manning 1997) and 41% married and 29% dissolved (Bumpass and Sweet 1989) by the second year. If a person is developing their potential at a faster rate than their partner is, they may be faced with a wider (or higher quality) possible dating pool. Thus, people may dissolve a cohabitation relationship as their partners are not realizing their full potential, or because they have access to more dating partners as their own dating capital accumulates. As these couples are cohabiting, it is assumed that they have already assessed their partner's potential to some extent. The partner has demonstrated enough potential to be a suitable residential partner, but not enough potential as a suitable marriage partner.

According to Becker's original formulation, economic factors play a large role, with the most desirable husbands (Becker's formulation is explicitly gendered) being those who have the highest earning potential and thus can provide economic security to a partner (Becker 1973). Numerous studies have found that those at a socioeconomic disadvantage are more likely to cohabit. In a study of non-married women who are dating, women with lower educational attainment were more likely to cohabit rather than be in a non-cohabitating dating relationship (McGinnis 2003). Other studies confirm that the trend toward cohabitation is lead by those who are the least educated, with cohabitation replacing early marriage among this population (Bumpass et al. 1991, Bumpass and Lu 2000). Limited economic resources also play a part in

decisions to cohabit, with qualitative interviews finding that financial pressure often encouraged people into cohabitation (Sassler 2004, Smock et al. 2005). Thus, people with relatively lower income may use cohabitation as a way to obtain the attractions of a residential relationship, yet avoid the legal barriers that may prevent a quick dissolution if a partner's economic circumstances change.

Looking at economic factors as predictors of dissolution or marriage, mixed results are found. A study that looked at female cohabiters, and included all previous relationship statuses, found that female income for non-poor women had a negative association with the probability of marriage, with no effects for poor women (Lichter et al. 2006). Other studies have found no effect for female income, but found that male earnings is positively related to the odds of marriage vs. cohabitation with no effects upon dissolution (Sanchez et al. 1998). Other studies have found that increased couple income is related to increased risk of dissolution (Brines and Joyner 1999).

As couples may be in the early years of their union formation, earnings potential as measured by education achievement may be a strong predictor of union transitions. It has been found that males with a college education are more likely to transition to marriage than their counterparts who have less than a high school degree (Smock and Manning 1997). This is supported by Lichter el at. (2006) who find no effect for females, yet males with a high school degree are more likely to both marry and dissolve than those with less than high school degrees while those with a college degree are more likely to marry.

Barriers

As marriage is a socially and legally recognized union, there are barriers that must be overcome when dissolving a marriage. Economic barriers include the cost of divorce, legal fees, the division of assets and the increased cost of living associated with living as a single person, and possibly as a single parent. Couples also may face social stigma and religious disapproval (Levinger 1979). A study on divorces found two distinct groups, those with low and high distress marriages. It was hypothesized that those with low distress marriages (ones we would think of as containing attractions for the partners) dissolved as there were low barriers to divorce (Amato and Hohmann-Marriott 2007). The benefits to a relationship are not static, but accrue over time as relationship specific capital (Becker 1981). Relationship specific capital includes joint assets, children as well as shared experiences. The loss of this capital is considered a barrier, as dissolving the relationship involves the disentangling and probable loss of this capital. Thus, when a relationship is new, there is very little relationship-specific capital as partners have invested very little of their time, effort and money into a relationship; therefore it has low barriers to dissolution.

According to the above theories, those in partnerships with more traditional gender roles are more likely to have a stable relationship. If one partner specializes in market labor, yet has no domestic skills, their ideal match is a partner who lacks market skills but specializes in domestic labor; both partners will increase their wellbeing by entering into a relationship (Becker 1973). Marriage provides extra security against dissolution, which allows each partner to develop their complementary skills, which is especially important for the partner who is forgoing labor skills in favor of non-market skills.

Measures of women's participation in the labor force may not indicate egalitarian gender beliefs, but may be associated with lower income couples where two incomes are necessary.

Qualitative interviews with cohabiting couples provide a valuable insight into these processes. A study of 115 lower-middle and working class couples (Smock et al. 2005) provides a more nuanced picture of cohabitation. When it came to partner income, three times as many women mentioned that their partner's income would have to rise before marriage as compared to men. Additionally a third of people mentioning economic factors as a barrier to marriage explicitly mentioned that a man's role was to provide for his family. Among these couples, although they may objectively have an egalitarian relationship if measured by economic variables, the male fulfillment of his traditional provider role was a prerequisite for marriage. Thus:

(1) Higher household income will be associated with a higher probability of marriage while discouraging dissolution.

(2) A higher proportion of male income will be associated with increased chances of marriage.

(3) Those currently enrolled in education will be less likely to marry while educational achievement will be associated with higher chances of marriage and less chance of dissolution. These effects will be stronger for males than females.

(4) Those who are not able to report their partners income will have a high chance of dissolution and a low probability of marriage

When considering children and fertility, there are very few studies that have addressed this explicitly, which is unusual as around 40% of cohabitating couples have children present (Casper and Bianchi 2002) and 11% of children are born to cohabiting parents (Bumpass and Lu 2000). One study which addressed the role of fertility explicitly found that conceiving a child during a cohabitation increased the probability of marriage and decreased the odds of dissolution,

while a cohabiting birth decreased the chances of marriage (Manning 2004). Another study compared the risk of dissolution for those who had their first child in a cohabitation relationship as compared to those whose first child was born while married (Wu and Musick 2008). The authors found that those who had their child while cohabiting and did not eventually marry had the highest risk of dissolution. Lichter et al. (2006) finds having children in the household reduces the odds of dissolution for poor women and Smock and Manning (1997) find that having a child present increases the likelihood of transitioning to marriage with no association with dissolution.

(5) Experience of a pregnancy will be strongly associated with the probability of marriage while providing a protective effect against dissolution.

Studies have shown that there are racial differences when it comes to family formation behaviors. Lichter et al. (2006) found that Black women were significantly less likely to transition to marriage than white women were, but there was no association with the odds of dissolution. They were also significantly more likely to dissolve their relationship rather than marry. When considering cohabiting parents, it was found that there was no difference between black and white women when it came to the risk of dissolution (Osborne et al. 2007). Turning to predictors of marriage, it has been found that Black cohabiters are more likely to report marital intentions, yet less likely to marry when compared to white couples (Guzzo 2009).

Current Study

The current study seeks to build upon the previous literature in several ways. By using monthly measures of relationship status, relationships shorter than a month and as long as 16 years were included. As noted above, most cohabitation relationships are of short duration, thus

being able to include these cases allows us to capture a larger (and more representative) percentage of cohabitation relationships. Monthly data also allows a test of the effect of fertility events on union transitions; this is vital to establish the correct temporal order of these events. The data also allows us to separate a couple's biological fertility events from those that involved a previous partner. There is also higher confidence in the accuracy of the data as respondents are being asked about events that happened within the previous year, with studies showing that retrospective surveys contain errors when estimating time in a cohabitation relationship (Teitler et al. 2006) and men's fertility (Rendall et al. 1999).

Survey waves from 1997 to 2009 are used, allowing for an update of previous cohabitation data (with relationship histories spanning January 1994 up to May 2010). The sample is also focused upon first cohabitations, which are likely to differ from cohabitations later in the life course (King and Scott 2005), especially those that occur after divorce. Previous studies show or hypotheses that the predictors or relationship transitions differ by gender, therefore separate analyses will be run for each group as well as between those who experienced a biological fertility event and those who experienced no fertility events.

Sample

Data were drawn from the National Longitudinal Survey of Youth 1997 cohort (NLSY97), a longitudinal study with data being drawn from the currently avaliable 13 waves. When first interviewed in 1997, the respondents were aged from 12-18 with the ages ranging from 22-28 in the latest data wave in 2007. Thus, the sample is not generalizable to the population at large, but is representative of youth born in America between January 1st, 1980 and December 31st, 1984. Respondents were interviewed annually. Of the 9,806 people identified as

eligible, 8984 completed the first wave interview, for a response rate of 92% (Moore et al. 2000). The original sample size in wave one was 8984 with 83% of respondents retained in the final wave for a sample size of 7,418. If a respondent was not retained between waves, the information that was collected previously was used in the analysis, though no information on their relationship outcome could be included.

On my variable of interest, 4,787 people (46% of the original sample) had cohabited with a romantic partner by the last data wave. Only those who had cohabited with an opposite sex partner as their first co-residential relationship were included in the risk set. One advantage of the NLSY97 data is it allows the construction of monthly measures of respondent relationship status as well as indicators for multiple relationship transitions in that month; thus, relationships ranging from less than a month to 16 years in duration are included. As a competing risks event history analysis was used, a person month data file was constructed, with each month a respondent was in a cohabiting relationship contributing an observation, resulting in a total of 102,648 observations. The number of observations is determined by $\sum T_i$ where T is the number of months that case i was in the data set.

Dependent Variable

The research question is focused on transitions in relationship status for people who were in their first cohabitation relationship. Therefore, a nominal variable was constructed indicating their relationship status in each month, with a base value of 0 for those who were currently cohabiting. A value of 1 indicates that the respondent had married that month, while a 2 indicates that the relationship had dissolved. Once people had made this transition, they were censored

from the data set, as I was interested in predicting the transition from first cohabitation and not people's subsequent relationship trajectories.

Independent Variables

The literature identifies economic factors as primary when people discuss prerequisites to marriage. Therefore, several indicators and measures of economic resources and arrangements were used to provide a nuanced analysis. The NLSY provides information on both partner and respondent income, allowing the generation of variables by gender to test if the percent of couple income provided by the male partner had an effect. Personal income consists of wages, tips, salary and income from a farm or business. Respondents were asked to provide a dollar amount. If they were not able to provide a specific amount, they were then asked to estimate which range their income was most likely to fall. In these cases, the midpoint of the range was used. If they failed to provide this as well, they were coded as missing. A household income variable was also constructed, as some income questions did not specify which partner was the one receiving income, and some income is generated from joint endeavors. In addition to containing the above personal income information from both partners, household income included social security payments, alimony, pensions or retirement, insurance payments and any other source of income.

A variable measuring if partner income information was missing was constructed as a measure of couple disclosure (0 = not missing, 1 = missing). This was only coded as 1 if the partner information was missing but the respondents information was not, thus those who were unable to report any income information were not coded as unable to report their partner's income. The NLSY also provides various missing data codes, thus only respondents who reported they did not know their partner's income were included (as opposed to those who

refused to provide their partner's income). Note that all income information was supplied by the respondent.

A dummy variable for college educational enrolment was created to signify if the respondent was engaged in tertiary education for that month. This variable includes 2 year or 4 year colleges as well as graduate programs (0 = not currently enrolled, 1 = currently enrolled). As this is a dynamic variable, respondents could move in and out of education depending upon their monthly enrolment status. A set of dummy variables measuring educational degree were also created, measuring if the respondent had completed high school or a GED, an associates degree, a bachelors degree or an advanced degree. Those with no high school degree are the reference category. Note that these categories are not mutually exclusive; that is, those with a bachelors degree have also obtained a high school degree. To measure monthly employment, hours worked per month was used. As some responses seemed unusually high (highest reported value was 672 hours, or 21.68 hours a day for 31 days), the analysis was also run with a capped variable (capped at 10 hours a day for 31 days). No substantive differences were found in preliminary analyses, thus the uncapped variable was used.

Various measures of pregnancy and the presence children were also constructed. A measure of pregnancy was constructed, indicating if the respondent or the partner was pregnant in that month (0 = not pregnant, 1 = pregnant). Only those who were pregnant by their current partner were included in this variable, called biological pregnancy. As no information was available on time of conception, this variable was constructed by assuming conception was 9 months before the month in which the child was born. Two variables indicating the presence of a child were also created, with the first measuring the presence of a biological child (both partners are biological parents) and a non-biological child (only one partner is a biological parent). Thus,

a person would be coded as pregnant for 9 months, and then coded as having a child present in the household. Note that these are binary variables, so they are not sensitive to the number of children and only the first child is used to construct these variables.. A separate variable was also constructed to indicate if the couple experienced a biological fertility event at any stage of their relationship. This is a time invariant variable, if they experienced an event at any stage, they were coded as one. This variable was used to divide the sample into those who experienced no fertility events and those with biological fertility events. Separate analysis was then run for each group to see if any predictors differed.

Dummy variables for Non-Hispanic Black and Non-Hispanic Other and Hispanic were created, with Non-Hispanic White as the reference category. A variable measuring the respondent's age at first sex was created. The age of the respondent when starting the relationship was also included. Both these variables were measured in months but converted to years for ease of interpretation.

Analysis procedure:

When estimating the impact of covariates on the likelihood of an event occurring, it is vitally important to model time correctly. For this paper competing risk proportional subhazard models as developed by Fine and Gray (1999) were used. This method is based on Cox proportional hazard models (Cox 1972) which have many desirable properties that make them especially suited for this research question. The first advantage is that a Cox model does not assume an underlying distribution of the hazard model. Cox proportional hazard models estimate a baseline hazard function and then estimate the effect of the covariates upon this baseline hazard; thus the underlying distribution can take any form.

The second advantage is that Cox models account for the right censoring of the data. This is especially important for our research question as very few couples cohabit for long term periods, the vast majority will experience some form of transition. Thus, a Cox model will explicitly account for this censoring and adjust the estimates to accurately model transitions. The third advantage is that Cox proportional hazard model takes into account tied failure times.

When predicting the transition from cohabitation, we have two possible outcomes; marriage and dissolution. Thus, when estimating our models, we need to take account that some observations are not truly censored (that is, exit the dataset without transitioning) but rather experience a competing transition. To take this competing outcome into account, a competing risks model will be used which incorporates both those who have not yet transition and those who previously experienced a competing risk into the risk set. This is accomplished by estimating the partial likelihood given by Kalbfleisch and Prentice (1980):

$$L(\beta_{1,\dots m}) = \prod_{j=1}^{m} \prod_{i=1}^{k_j} \left[\frac{\exp\left[Z_{ji}(T_{ji})\beta_j\right]}{\sum_{l \epsilon R(t_{ji})} \exp\left[Z_l(T_{ji})\beta_j\right]} \right]$$

where m denotes the number of competing risks j and k_j denotes the number of i individuals that experience j. Z_{ji} is a vector of covariates measured at T and β_j is a time invariant parameter vector (that can vary according to failure type j). Thus, the formula creates an interaction between time, time-invariant covariates and time varying covariates for each moment of time for each failure type. $R(t_{ji})$ is defined as the risk set at the time of failure for the ith individual; this includes two groups. The denominator is thus a summation of a vector of covariates representing those who have not yet failed and those who have failed previously to a competing cause (Fine and Gray 1999). Thus, we obtain the partial likelihood estimator $L(\beta_{1\dots m})$ for m number of failures j.

(table 1 about here)

Missing Data

There is a large amount of missing data upon income variables. As noted above, respondents were given a range of options when answering this question and were only coded as missing if they could not supply any information. Creation of the 'male percent of couple income' variable required valid responses from both partners, thus there is more missing data upon this variable. As can be seen in Table 1, the largest number of missing data came from respondent's being unable to report their partner's income. To correct for possible bias, a dummy variable was included in all models indicating if this information was missing, as well as being a variable of substantive interest. All missing values were dealt with using multiple imputation using STATA's MICE (multivariate imputation by chained equations) program (Royston 2005). This had been identified as one of the best methods of dealing with missing data (Allison 2002). Five iterations were used.

Results

Descriptive Statistics

Descriptive statistics are available in Table 1. This table was divided into two parts, one for the categorical variables and the other for the continuous variables. The top portion provides the mean, standard deviation, minimum and maximum values. The bottom portion provides the total number of person months provided by the people in each category for the stable variables (race, gender), the cases in each category and the percentage of person months that the people in each category contributed. For the dynamic categories such as enrolment status or pregnancy, the table shows the number of cases who experienced a state, the number of person months spent in

a state, and the percentage of person months spent in the state. The number of cases refers to the amount of people who experienced any time in a state.

Overall, out of the cohabiting sample of 4,787, 1211 people got married, 2652 relationships ended in dissolution, and 924 were still cohabiting at the last data wave. Thus only 25% of relationships transitioned into marriage. The majority, 57%, of the sample did not experience any fertility event (defined as a pregnancy, birth, or presence of a child) with 30% experiencing a fertility event with their current partner and 12% with a different partner; defined as a partner that was not their first residential partner. Looking at race, the sample was 51% Non-Hispanic White, 25% Non-Hispanic Black, 21% Hispanic and 3% Non-Hispanic Other.

(table 2 about here)

Competing Risks Regression Results

Each model in Tables 2-4 contains two equations across four columns. The first column contains the competing risks regression coefficient of marriage as compared to cohabitation with dissolution as a competing risk. The second column contains the test of the proportional subhazard assumptions; a significant value indicates that proportional subhazards assumption has been violated and the effect of the variable changes over time. A value greater than zero indicates the effect of the variable on the subhazard rate increases over time; and a negative value indicates that the effect decreases. The third and fourth column provides the same information for dissolution with marriage as a competing risk.

Model 1 in Table 2 contains all our variables excluding the measures of fertility. All racial groups have a significantly decreased hazard of marriage as compared to our non-Hispanic White reference group. Non-Hispanic Blacks have an increased hazard of dissolution (sub-hazard ratio of 0.467) while Hispanics have a lower hazard (SHR = 0.861) of dissolution as

compared to non-Hispanic Blacks. The age at which the relationship started reduced the subhazard ratio of both marriage and dissolution. This may be an artifact of the sample construction, as those who start cohabiting at later ages are more likely to experience right censoring as they are not at risk of transitions for the same period that earlier cohabitors are. Those who were older when they first had sex have a higher subhazard ratio of marriage, with the subhazard ratio increasing by 4% for each year.

Those enrolled in college had a lower hazard of marriage than those not enrolled with a decrease in the subhazard ratio of 0.24. Those enrolled were a greater hazard of dissolution with a 0.18 increase in the subhazard ratio. Educational attainment had significant effects with those with a high school degree having a greater hazard of both marriage and dissolution than those without a high school degree. Note that educational attainment is not mutually exclusive, so although the coefficient for associates' degree is not significant, all of those in this category will have already obtained a high school degree, thus they will still have a higher hazard of marriage and dissolution than those without a high school degree. Those with a bachelor's degree have an increased hazard of marriage over and above the effect of just a high school degree. Thus, the overall effect of a college degree is a doubling of the subhazard rate (2.06) as compared to not having a high school degree.

Household income has on effect upon marriage while it is positively correlated with the hazard of dissolution. The relative amount of income the male partner earns has no effect upon the hazards of relationship transitions; however not being able to report your partner's income has strong effects upon both marriage (with a subhazard ratio of 0.57) and dissolution (with the subhazard rate 4.21 times the size of the baseline subhazard rate). Both of these effects become weaker with time, as indicated by the test of the proportional hazards assumption. Hours worked

in the month slightly decreases the hazard of dissolution, with each additional hour of work decreasing the subhazard by 0.01.

Model 2 includes our indicators of biological fertility events. Having a biological pregnancy increases the hazard of marriage dramatically (subhazard ratio of 2.59) and reduces the hazard of dissolution (although this protective effect weakens over time). Having a biological child present reduces the hazard of dissolution with no effects upon marriage likelihood. The effect having a biological child present on the hazard of dissolution increases over time. Model 3 shows that having a non-biological child present increases the hazard or marriage (with a decreased effect over time). Although this may seem counterintuitive, it should be remembered that those who formed a relationship with someone who already have a non-biological child (out of the 570 who had a non-biological child present at one time, 520 of them had the child present at the start of the relationship) were aware of the child and may have entered the relationship with a higher level of commitment and marriage expectations. Or put more simply, there is likely a large selection effect.

(table 3 about here)

Exchange theory predicts that the most valuable relationship-specific capital a couple can have is children together. Thus, I separate those who have had biological fertility events compared to those who have had no fertility. A Clogg test (Clogg et al. 1995) was used to test for equality of coefficients between groups. The results of this are presented in Table 3. Among non-Hispanic Blacks, those with no fertility events had a significantly higher hazard of dissolution than non-Hispanic Blacks with a biological fertility event. Among Hispanics, those with a biological fertility event had a significant lower hazard of marriage, while there was no effect for Hispanic among those with no fertility. The age the relationship started has less effect among

those who have had experienced a fertility event; though it still decreases the chances of dissolution.

Among the education variables being enrolled in college has no effect upon the hazard of a transition among those with biological fertility. Among those with no fertility, being enrolled in college reduces the hazard of marriage and the coefficients are significantly different between the two groups. Having obtained a high school degree significantly increases the hazard of marriage among those with biological fertility events with a subhazard ratio of 2.13. There is no effect of education variables among those with no fertility. Once again, having the partner income missing drastically decreases the chances of marriage and increases the chances of dissolution with no significant differences between the two groups.

(table 4 about here)

Previous literature and exchange theory predicts that gender roles still have relevance among contemporary couples. Table 5 explicitly tests this and presents separate regressions for males and females. Contrary to predictions, there is only one significant difference between males and females. If a couple has a biological pregnancy, there is a stronger protective effect against dissolution for males rather than females. This may indicate a problem with the data as this is a couple level process that should not have differing effects by gender. That is, if a relationship dissolves, it dissolves for both males and females, thus a pregnancy that involves both of the couple should not have differing effects.

Discussion and Conclusion

This study extends exchange theory (Becker 1973, Becker 1974, Becker 1981, Levinger 1979) to cohabitation relationships. Traditional exchange theory revolves around the

conceptualization of attractions, barriers and alternatives. I theorized that cohabitation would provide a chance for people to explore the possible attractions of a relationship without facing the same barriers to leaving should these attractions fail to materialize. As people gained economic capital and increased their education, their access to higher quality partners would increase and thus they would increase their pool of alternative partners.

Much higher rates of dissolution as compared to marriage were found relative to previous estimates. Only 25% of relationships transitioned into marriage with 55% of couples dissolving their relationship. This compares to an approximately equal amount of relationships ending in marriage and dissolution found in previous studies (Lichter et al. 2006, Bumpass and Sweet 1989, Brown 2004, Guzzo 2009). The current finding of higher dissolution may be due to several factors. The first is our sample construction; we are focusing on one cohort of young cohabitors. Those who cohabit earlier may have more unstable relationships than those who form cohabitations at older ages.

The second explanation is a cohort effect. That is, those relationships currently being formed by young people are more unstable than those formed by young people in previous years. Although this cannot be tested with this data, numerous researchers advanced this explanation as the most likely (Cherlin 2004, Bumpass et al. 1991) Future waves of the NLSY will allow us to see if there is an age effect or if this cohort will continue to experience unstable cohabitation relationships regardless of the age at which they were formed.

The most unexpected finding was the relationship between our various economic variables and the hazard of relationship transitions. Household income had a positive effect upon dissolution; a result which held for all model specifications. This contradicts research that has found that household income has a negative effect upon the probability of dissolution (Lichter et

al. 2006). It is possible that rising income increases the quality of dating pool and provides people with the economic resources to leave a bad relationship. This hypothesis is not directly tested in our study as we do not have a variable that indicates which partner instigated the dissolution. It would be interesting to see if rising partner income relative to the other partner made the instigation of dissolution more likely. In contrast to qualitative findings (Smock et al. 2005), male income did not have any effect on the hazard of transitions in any of our models. Thus, it may be that among cohabitating couples it is absolute income levels, rather than market specialization, that presents the greatest barrier to dissolution.

Hours worked in the month had a negative association with the hazard of dissolution, with no association with marriage probabilities; as income is included in the model, this result must be interpreted with this in mind. This means that increasing of work hours independent of income (that is without an increase in income) provides a protective effect against dissolution. This fits with the theory of cohabitation as a capital building stage as a respondent may show increased potential as a marriage partner by increasing their hours and showing a commitment to work. Even though it is not associated with an increase in the hazard of marriage, it provides protection against dissolution.

Enrollment in college is negatively associated with the hazard of marriage and an increased hazard of dissolution, which provides partial support for hypothesis four. When divided up by fertility events, there is only an effect for those with no fertility events on the hazard of marriage. This indicates that college as a capital building stage may only apply to those without any fertility; which is consistent with exchange theory. Indicators of potential may only have relevance among those with no children, as a child is considered the greatest relationship specific capital there is.

Obtaining a high school degree increased the hazard of both marriage and dissolution for the full sample, for those with biological fertility and for men (although there was no significant difference between the male and female coefficients). Obtaining a bachelors degree increases the marriage hazard, with no effects upon dissolution. Although females have significant coefficients when we divide the sample by gender, the coefficients between men and women are not significantly different. This contradicts previous research which shows effects for males but not females (Lichter et al. 2006), although this study shows higher education is associated with both marriage and dissolution. As education rises, individuals may choose to marry as their partner realizes their potential and becomes an attractive marriage partner, or alternatively their own rising education may increase their capital and increase their pool of alternative partners.

If a respondent did not report their partner's income this was associated with a reduction of in the hazard of marriage and an increase in the hazard of dissolution. This was found across all models and subgroups, suggesting this finding is robust. The vast majority of couples (85%) experienced income non-disclosure at some stage in their relationship. The non-disclosure of income information suggests that partners are not committed or do not fully trust each other. An alternative explanation suggests that if a partner is not sharing this information, the respondent is unable to assess accurately a partner's earning capabilities and may not be able to quantify the attractions of the relationship.

The effect of non-disclosure is reduced over time for both marriage and dissolution subhazard rates. There may be two types of couples; those who are looking to transition to marriage and require accurate partner information and those who are choosing cohabitation as a long term relationship format specifically because it requires less commitment and disclosure. Among some couples, cohabitation may provide the benefits of a coresidential relationship while

choosing to maintain low barriers to dissolution. The strong and robust effects of this variable require further explanation and study in future research.

Turning to the fertility variables, it is found that those couples who are pregnant have a greatly increased hazard of marriage while being at less risk of dissolution. However, having a child in the household has no association with marriage hazard while decreasing the hazard of dissolution. This presents a problem for Becker's theory, as having a child with a partner represents relationship specific capital and therefore partner's should take steps to secure their investment of this capital. However, having a child still reduces the probability of dissolution, so among those with children, marriage may not be required as an extra barrier. As the effect of having a biological child increases over time, this indicates that having a child is an increasingly protective barrier against dissolution. This differs from previous research, as it was not found that a premarital birth decreased the probability of marriage (Manning 2004) or increased the probability of marriage (Smock and Manning 1997). However, it was found that a pregnancy increases marriage odds and provided a protective effect against dissolution (Manning 2004) and that having a child present decreases the probability of dissolution (Lichter 2006).

This study contributes to the literature on cohabitation transitions by testing various hypotheses drawn from both previous studies and exchange theory. This study suggests that exchange theory is applicable to cohabitation relationships; yet more work needs to be done. This study could benefit from the inclusion of a more precise measure of financial disclosure, does the couple have a shared bank account for example. A major limitation of this study was the lack of available information on relationship quality and intention. Exchange theory explicitly includes relationship quality as a vital part of its formulation, yet due to a lack of information, this could not be included. Thus, this study was restricted to mainly economic explanations,

which may be misrepresenting the union formation process. There was also no information on if respondents were engaged when moving in together, which is vital when discussing relationship commitment. Thus, while this study provides evidence for exchange theory as applicable to cohabitation, more work is needed.

This study builds upon previous literature by including shorter cohabitation relationships that have been missed in previous studies. As this study found a large number of transitions within the first year of a relationship, this is an important improvement. Using prospective data allows us to have greater confidence in the findings and allowed the correct temporal ordering of events. This is especially relevant for the fertility variables, which allowed precise measurement of fertility timing. From this study, it seems that cohabitation relationships are particularly unstable among recent cohorts. It is possible that multiple cohabitations before marriage will become the norm among young adults and this trend may increase over time.

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Table 1: Descriptive Statistics

Continuous Variables

Time Invariant	Mean	Min	Max	Cases
Age relationship started	255.66	165	356	4787
Age at first sex	15.45	5	24	4566
Time Varying	Mean	Min	Max	Person Months
Hours worked in month	120.44	0	672	100065
Household Income	48072.41	0	425586	75523
Male Percent of Couple Income	59.2	0	100	46120

Categorical Variables

Time Invariant	Number of Cases		Valid Cases	Number of person Months		Valid person months
Female	2,539	53.04%	4,787	55,086	53.66%	102,648
Any Biological Fertility	1,426	29.79%	4,787	43,123	42.01%	102,648
No Fertility	2,729	57.01%	4,787	47,843	46.61%	102,648
Hispanic	1,016	21.3%	4,771	26,902	26.31%	102,250
Non-Hispanic Other	133	2.79%	4,771	2,880	2.82%	102,250
Non-Hispanic Black	1,199	25.13%	4,771	23,211	22.7%	102,250
Non-Hispanic White	2,423	50.79%	4,771	49,257	48.17%	102,250

Time Varying	Number of cases who experienced this state		Valid Cases	Number of person months		Valid person months
Obtained Bachelors Deg.	565	11.8%	4,787	10,157	9.89%	102,648
Obtained Associates Deg.	216	4.51%	4,787	4,463	4.35%	102,648
Obtained High School Deg.	3,661	76.48%	4,787	76,591	74.62%	102,648
Enrolled in College	1,167	24.47%	4,770	14,103	13.8%	102,201
Biological Child Present	1,195	24.96%	4,787	31,280	30.47%	102,648
Currently Pregnant With Biological Child?	1,038	21.68%	4,787	6,373	6.21%	102,648
Non-Biological Child	570	11.91%	4,787	10,656	10.38%	102,648
Partner Income Missing	4,044	84.74%	4,772	49,313	48.18%	102,360

Table 3: Competing Risks Regression predicting the cumulative incident function of relationship transitions

	Model 1				Model 2				Model 3			
	Married		Dissolved		Married		Dissolved		Married		Dissolved	
	Coeff	Time Interaction	Coeff	Time Interaction	Coeff	Time Interaction	Coeff	Time Interaction	Coeff	Time Interaction	Coeff	Time Interaction
Non-Hispanic Black	-0.761**		0.421**		-0.838**		0.436**		-0.762**		0.404**	
	(0.091)		(0.047)		(0.092)		(0.047)		(0.092)		(0.048)	
Non-Hispanic Other	-0.505**		0.075		-0.575**		0.105		-0.510**		0.069	
	(0.195)		(0.117)		(0.198)		(0.115)		(0.195)		(0.117)	
Hispanic	-0.265**		-0.150**		-0.396**		-0.096		-0.264**		-0.154**	
	(0.076)		(0.054)		(0.080)		(0.054)		(0.076)		(0.054)	
Age relationship started	-0.026*		-0.120**		-0.011		-0.124**		-0.027*		-0.124**	
	(0.013)		(0.009)		(0.014)		(0.009)		(0.014)		(0.009)	
Age at first sex	0.042**		-0.013		0.045**		-0.013		0.043**		-0.010	
	(0.015)		(0.009)		(0.015)		(0.009)		(0.015)		(0.009)	
Enrolled in College	-0.277*	-0.003	0.165*	-0.002	-0.167	-0.003	0.073	0.001	-0.252*	-0.005	0.169*	-0.001
	(0.126)	(0.005)	(0.078)	(0.004)	(0.129)	(0.005)	(0.079)	(0.004)	(0.127)	(0.005)	(0.078)	(0.004)
Obtained High School Degree	0.428**	0.001	0.182*	-0.005	0.448**	0.002	0.142*	-0.003	0.429**	0.001	0.189**	-0.005
	(0.129)	(0.005)	(0.071)	(0.003)	(0.129)	(0.005)	(0.071)	(0.003)	(0.129)	(0.005)	(0.071)	(0.003)
Obtained Associates Deg.	0.201	0.002	-0.161	0.008	0.231	0.003	-0.246	0.010	0.213	0.002	-0.157	0.008
	(0.174)	(0.006)	(0.165)	(0.005)	(0.177)	(0.006)	(0.168)	(0.005)	(0.174)	(0.006)	(0.165)	(0.005)
Obtained Bachelors Deg.	0.296*	0.001	-0.201	-0.005	0.316*	0.004	-0.289*	-0.002	0.322**	-0.000	-0.187	-0.004
	(0.119)	(0.004)	(0.112)	(0.004)	(0.124)	(0.005)	(0.114)	(0.005)	(0.120)	(0.004)	(0.112)	(0.004)
Household Income	-0.001	0.000	0.002**	0.000	-0.001	0.000	0.002**	0.000	-0.001	0.000	0.002**	0.000
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Male Percent of Couple Income	-0.002	0.000	0.002	-0.000	-0.002	0.000	0.002	-0.000	-0.002	0.000	0.002	-0.000
	(0.003)	(0.000)	(0.002)	(0.000)	(0.003)	(0.000)	(0.002)	(0.000)	(0.003)	(0.000)	(0.002)	(0.000)
Partner Income Missing	-0.563**	-0.032**	1.438**	-0.009**	-0.523**	-0.030**	1.403**	-0.008**	-0.565**	-0.032**	1.436**	-0.009**
	(0.101)	(0.005)	(0.073)	(0.003)	(0.102)	(0.005)	(0.074)	(0.003)	(0.101)	(0.005)	(0.073)	(0.003)
Hours worked in month	-0.000	0.000*	-0.001*	0.000	-0.000	0.000*	-0.001*	0.000	-0.000	0.000*	-0.001*	0.000
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Currently Pregnant With Biological Child Present					0.951**	-0.003	-0.685**	-0.044**				
					(0.145)	(0.010)	(0.166)	(0.016)				
					0.226	0.011**	-0.557**	0.014**				
					(0.126)	(0.004)	(0.080)	(0.003)				
Non-Biological Child									0.416*	-0.023*	0.098	0.004
									(0.174)	(0.009)	(0.079)	(0.003)
Observations	97612											
Cases	4787											
Events	1211		2652									

Robust standard errors in parentheses

** p<0.01, * p<0.05

Table 4: Competing Risks Regression predicting the cumulative incident function of relationship transitions by fertility experience

	Any Biological Fertility				No Fertility			
	Married		Dissolved		Married		Dissolved	
	Coeff	Time Interaction	Coeff	Time Interaction	Coeff	Time Interaction	Coeff	Time Interaction
Non-Hispanic Black	-0.921**	0.764**a			-0.765**		0.368**	
	(0.137)	(0.098)			(0.154)		(0.065)	
Non-Hispanic	-0.657*	0.326			-0.594*		0.145	
Other	(0.315)	(0.221)			(0.280)		(0.147)	
Hispanic	-0.548**a	0.078			-0.189		0.077	
	(0.113)	(0.103)			(0.120)		(0.070)	
Age relationship	-0.043	-0.095**a			-0.004		-0.158**	
started	(0.024)	(0.019)			(0.018)		(0.012)	
Age at first sex	0.021	-0.009			0.069**		-0.023	
	(0.024)	(0.018)			(0.020)		(0.012)	
Enrolled in College	0.362a	0.225	-0.009	-0.012	-0.393*	-0.000	-0.026	0.004
	(0.224)	(0.217)	(0.007)	(0.009)	(0.173)	(0.008)	(0.096)	(0.005)
Obtained High	0.757**a	0.007	-0.004	-0.005	0.172	0.017	0.064	0.005
School Degree	(0.181)	(0.137)	(0.004)	(0.006)	(0.218)	(0.011)	(0.103)	(0.006)
Obtained	-0.207	0.149	0.004	0.010	0.252	0.002	-0.329	0.012
Associates Deg.	(0.461)	(0.529)	(0.013)	(0.012)	(0.216)	(0.008)	(0.209)	(0.008)
Obtained	0.354	-0.099	-0.012	0.002	0.215	0.004	-0.290*	0.002
Bachelors Deg.	(0.374)	(0.460)	(0.016)	(0.012)	(0.147)	(0.006)	(0.128)	(0.006)
Household Income	-0.001	0.003*	0.000	0.000	-0.001	0.000	0.001*	0.000
	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
Male Percent of	-0.001	0.002	-0.000	0.000	-0.006	0.000	0.002	0.000
Couple Income	(0.002)	(0.003)	(0.000)	(0.000)	(0.011)	(0.001)	(0.003)	(0.000)
Partner Income	-0.434**	1.557**	-0.011**	-0.018**	-0.421**	-0.048**	1.392**	-0.010*
Missing	(0.158)	(0.149)	(0.004)	(0.006)	(0.146)	(0.009)	(0.100)	(0.005)
Hours worked in	-0.001	-0.001	0.000	0.000*	0.000	0.000	-0.001	0.000
month	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Observations	41574				45026			
Cases	1426				2729			
Events	437		690		667		1559	

Robust standard errors in parentheses

** p<0.01, * p<0.05

a indicates a significant difference between coefficients

Table 5: Competing Risks Regression predicting the cumulative incident function of relationship transitions by gender

	Males				Females			
	Marriage		Dissolution		Marriage		Dissolution	
	Coeff	Interaction	Coeff	Interaction	Coeff	Interaction	Coeff	Interaction
Non-Hispanic Black	-0.776**		0.462**		-0.857**		0.382**	
	(0.134)		(0.071)		(0.129)		(0.064)	
Non-Hispanic Other	-0.545		0.166		-0.618*		0.046	
	(0.297)		(0.180)		(0.270)		(0.151)	
Hispanic	-0.454**		-0.042		-0.363**		-0.128	
	(0.125)		(0.081)		(0.105)		(0.072)	
Age relationship	0.005		-0.130**		-0.035		-0.109**	
started	(0.019)		(0.012)		(0.021)		(0.013)	
Age at first sex	0.050*		-0.009		0.051*		-0.025	
	(0.021)		(0.012)		(0.022)		(0.014)	
Enrolled in College	0.076	-0.016	-0.112	0.002	-0.249	0.000	0.168	-0.000
	(0.221)	(0.011)	(0.148)	(0.008)	(0.163)	(0.006)	(0.095)	(0.004)
Obtained High	0.667**	-0.004	0.139	-0.006	0.293	0.008	0.143	-0.003
School Degree	(0.202)	(0.007)	(0.101)	(0.004)	(0.172)	(0.007)	(0.101)	(0.004)
Obtained	0.223	-0.002	-0.217	0.003	0.287	0.005	-0.265	0.013*
Associates Deg.	(0.236)	(0.009)	(0.282)	(0.011)	(0.266)	(0.008)	(0.208)	(0.006)
Obtained Bachelors	0.321	-0.000	-0.216	-0.009	0.402*	0.006	-0.349*	-0.001
Deg.	(0.196)	(0.008)	(0.198)	(0.010)	(0.167)	(0.006)	(0.143)	(0.005)
Household Income	-0.000	0.000	0.003**	-0.000	-0.001	0.000	0.002*	0.000
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
Male Percent of	-0.001	-0.000	0.003	-0.000	-0.003	0.000	0.001	-0.000
Couple Income	(0.003)	(0.000)	(0.005)	(0.000)	(0.006)	(0.000)	(0.004)	(0.000)
Partner Income	-0.422**	-0.026**	1.274**	-0.011**	-0.626**	-0.035**	1.503**	-0.005
Missing	(0.147)	(0.007)	(0.114)	(0.004)	(0.145)	(0.008)	(0.097)	(0.004)
Hours worked in	0.000	0.000	-0.001	-0.000	-0.001	0.000	-0.001	0.000**
month	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Currently Pregnant	1.141**	-0.018	-0.705**	-0.051**	0.770**	0.008	-0.642**	-0.038
With Biological	(0.207)	(0.014)	(0.205)	(0.016)	(0.202)	(0.013)	(0.235)	(0.023)
Biological Child	0.365*	0.006	-0.757**	0.017**	0.066	0.016**	-0.375**	0.015**
Present	(0.180)	(0.006)	(0.126)	(0.005)	(0.174)	(0.006)	(0.106)	(0.004)
Observations	45223				52389			
Cases	2248				2539			
Events	557		1199		654		1453	

Robust standard errors in parentheses

** p<0.01, * p<0.05

a indicates a significant difference between coefficients