

**Are Student Loans a Reverse Dowry?
The Dynamics of Debt Repayment and Marriage Formation in Young Adulthood**

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This paper examines the dynamics of student loan debt and family formation in young adulthood using a nationally representative sample of bachelor's degree recipients ($N = 9,380$). Drawing upon contrasting perspectives on economic resources and family formation, we examine whether student debt expedites the transition to marriage as predicted by the economic independence perspective, or delays the transition to marriage as predicted by the reverse dowry perspective. We find that total loan debt is unrelated to marriage, but that the dynamics of loan repayment are related to marriage timing. As loan debt decreases, the odds of marriage increase. This relationship is stronger for women than for men, and attenuates over time. These findings lend support to the reverse dowry perspective, which posits that the financial weight of monthly loan repayments acts as a reverse dowry, impeding family formation in the years immediately following college graduation.

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A 2006 headline in the *USA Today* “Students Suffocate Under Tens of Thousands in Loans” cautioned about a growing hindrance to the economic stability of young adults (Block 2006). The accompanying article alerted the public of a generational financial epidemic whereby the weight of debt is forcing many young adults to put off saving for retirement, getting married, buying homes and putting aside money for their own children's educations. The same year, a *CNN News* report referred to student debt as a “reverse dowry” and warned “Forget about getting married and buying a home, this generation is thinking about next months [student loan] payment” (Zappone 2006). These attention grabbing reports are not without merit, as national statistics point to an increase in student loan debt among American youth. In 2004 nearly two-thirds of bachelor’s degree recipients left college with student loan debt, up from less than 50% of graduates in 1993 (Project on Student Debt 2008). Further, during this time loan debt levels for graduating seniors more than doubled from \$9,250 to \$19,200 – a 58% increase after accounting for inflation (Project on Student Debt 2008).

While student loan debt is often considered “the best kind of debt to have” in that it typically has low interest rates and represents an investment in human capital, the magnitude of the total amount owed and monthly payments is likely overwhelming. This may be particularly so for young adults entering the workforce for the first time, for whom earnings are at their lowest and job instability is at its highest (Klerman and Karoly 1994). Therefore, as the aforementioned journalistic accounts suggest, student loan debt may act as a reverse dowry – impeding the transition to marriage, which involves substantial family formation costs (i.e. wedding, childbearing, home purchase, etc.) and resource redistribution (i.e. joint bank accounts, joint tax filing, joint budget, etc.). However, there is little to no empirical evidence to support

this proposition. The present paper explores the assertion that financial aid can alter the transition to adulthood by examining the student loan and marriage histories of a nationally representative sample of bachelor's degree recipients. In doing so, this paper sheds light on how the changing dynamics of loan repayment in young adulthood aligns with traditional demographic perspectives on the relationship between economic conditions and family formation.

BACKGROUND

The Cost of College Attendance

For young adults in the United States, the pay-off to higher levels of education, particularly the receipt of a bachelor's degree, is evident in greater job stability, better health, and most immediately relevant, income (Day and Newburger 2002; Mirowsky and Ross 2003). For example, in 1980, individuals holding a bachelor's degree earned approximately 26% more than those with only a high school diploma (U.S. Census Bureau 2006). By 2005, this earnings difference grew to 61% (U.S. Census Bureau 2006). However, given that the price of attendance has risen steeply, this compensation advantage is not without a cost. Between 1988-1989 and 2008-2009, tuition and fees (in constant dollars) at public four-year schools more than doubled (College Board 2008). Over this same interval, median family income growth was modest, increasing by only 13% (U.S. Census Bureau 2008).

For many, the high sticker price leads prospective students to rely on loans to pay for their education. The U.S. government distributes student loans via three main avenues: subsidized Stafford loans, unsubsidized Stafford loans, and Perkins loans. Subsidized Stafford loans have set maximum annual amounts that are interest free to students until they leave school,

six months after they graduate, or fall below part-time attendance status. Unsubsidized Stafford loans are also available regardless of student need, but the student is responsible for paying the interest that accrues while enrolled. Perkins loans are geared towards the most economically disadvantaged students and have the most favorable interest rates with an exemption while the student is still enrolled. Unlike Stafford loans, Perkins Loans are disbursed through individual institutions.

Approximately 43% of students borrow from at least one these federal loan programs; with low-income youth more likely to rely on loans than their high-income peers, and, as mentioned earlier, nearly two-thirds of bachelor's degree recipients graduate with loan repayment in their future (Project on Student Debt 2008). Saddled with this debt, the path to economic stability may be less smooth than it was for earlier generations of college graduates. With loan repayment becoming a modal facet of post-baccalaureate life, the demographic consequences are only now beginning to receive attention among social scientists. This paper explores this emerging trend by assessing whether student loan debt influences family formation in young adulthood.

Implications for Marriage Formation

With little research directly connecting college costs and life course transitions, we instead draw upon a well-established body of demographic literature that examines the relationship between economic resources and marital timing as an analytic framework. Most research in this area uses the economic independence hypothesis as a point of departure. Grounded in Becker's (1973, 1974) classic ideas about exchange and utility maximization, this hypothesis works from the premise that individuals are better off married than they would be

remaining single because both partners reap the benefits of joint resources. Within a traditional gendered division of household labor, where women serve as the homemaker and men as the breadwinner, marriage provides women with economic stability via their husband and his job. Even if women are employed themselves, their earning power is on average lower than men's (England 2006). Therefore, marriage should be an attractive option for women, particularly for those with limited economic resources. Women with ample income and a good job are less likely to need the support of a husband, and therefore, their odds of marriage should decrease.

This perspective is supported by research which finds a negative relationship between economic resources and the odds of marrying among women. For example, Goldscheider and Waite's (1986) analysis of the National Longitudinal Surveys of Young Women and Young Men showed that women from low-income families are more likely to marry than are women from high-income families. A similar relationship was detected in Teachman, Polonko, and Leigh's (1987) analysis of the National Longitudinal Study of the Class of 1972: lower wages were associated with increased odds of marrying for women. In both of these studies, economic resources were unrelated to the family formation patterns of men. Extending this reasoning to student loan debt, this perspective anticipates that higher levels of debt, which directly hinders wealth and asset accumulation, would expedite the transition to marriage, particularly for women.

With massive changes in sex roles and opportunity over the past two decades – increasing rates of labor force participation, shrinking wage differentials with men, and successfully balancing work and family roles – women are now less dependent on men for financial stability (Blau, Brinton, and Grusky 2006). Accordingly, marriage may no longer serve as an economic security blanket for women with limited resources. Instead, ample economic resources (i.e. well-

paying jobs, steady income, etc.) may signal “marriageability” to prospective partners. Classic ideas about the gendered division of labor anticipate that this should be particularly the case for men, as a job and steady income signal to potential mates their ability to support a household (Becker 1974). It might also be the case, as some researchers suggest, that ample resources allows both sexes more time to find the perfect mate since they are not immediately in pursuit of a supplementary income stream (Xie, Raymo, Goyette, and Thornton 2003). Whereas the economic independence hypothesis predicts a negative relationship between economic resources and the odds of marrying, this perspective anticipates a positive one: those with higher levels of economics resources should be more likely to marry than their less affluent peers.

A number of empirical analyses find support for this contention. For example, Clarkberg (1999) finds that earnings and income are positively related to marriage for both men and women. Similar relationships were found by Oppenheimer, Kalmijn, and Lim (1997); Teachman, Polonko, and Leigh (1987); and Xie et al. (2003). However, as anticipated by Becker, these relationships were limited to men only. Applying this model to financial aid repayment, student loan debt should act as a reverse dowry (as suggested by the *CNN News* article), impinging on the financial resources of young adults, making them less able to take on the costs associated with marriage and less attractive to potential partners. Thus, from this reverse dowry perspective we would expect to see that those with a greater debt burden should be less likely to marry than their peers with a lighter debt burden or no debt burden at all.

As there is little research in the family formation literature that directly explores the consequences of student loan debt, whether it expedites the transition to marriage (as predicted by the economic independence perspective) or delays the transition to marriage (as predicted by the reverse dowry perspective) is unknown. One of the only studies of which we are aware is

Chiteji's (forthcoming) analysis of young adults between the ages of 25 to 34 using the Survey of Consumer Finances. She finds that significantly more married young adults (72.4%) hold credit card and other on-collateralized debt (including student loan debt) than do their single peers (56.0%). However, after adjusting for demographic and socioeconomic characteristics, this difference is non-significant.

Though her findings lend tentative support to the economic independence perspective, she treats student loan debt as a static, time-invariant financial situation. In doing so, her findings gloss over the dynamic process of loan repayment and family formation during the young adult years. Upon finishing college, the weight of student loan debt, particularly for those who heavily relied on loans to finance their education, may preclude a serious consideration of marriage until they are able to get on their feet. Since earnings are lowest at the start of the career ladder, loan repayment as a proportion of total earnings is at its peak during the years immediately after college graduation. As time goes on, young adults adjust to their post-college financial situation, and eventually start to get promotions, earn raises, and obtain other assets. Consequently, loan repayment as a proportion of total wealth declines over time. At the same time, monthly loan statements gradually show a lower overall balance, which likely attenuates the initial sticker shock associated with the earliest loan payments. It should be the case, then, that any effect student loan debt has on marriage formation should be strongest immediately following bachelor's degree receipt and should dissipate over time.

With little known about the demographic consequences of debt, the present study aims to provide some basic information on this increasingly prevalent aspect of young adulthood. Specifically, this study addresses three questions: (1) Is there a relationship between student loan debt and the transition to marriage during young adulthood? (2) Does this relationship vary by

gender? and (3) Is this relationship constant over time? In doing so, this analysis will test the propositions of the economic independence perspective and the reverse-dowry hypothesis.

METHODS

Data

To explore the dynamics of student loan debt and family formation in young adulthood, we use data from the 1993 Baccalaureate and Beyond Longitudinal Study (B&B:93). Collected by RTI International for the National Center for Education Statistics (NCES) this study tracks the work, post-baccalaureate education, and family life experiences of a cohort of students after they earn a bachelors degree. B&B:93 uses the 1993 iteration of the National Postsecondary Student Aid Study (NPSAS), a nationally representative cross-sectional study of college students collected every two to three years by NCES, as its sampling frame. Of the nearly 53,000 students who participated in the 1993 NPSAS survey, 12,730 were identified as bachelor's degree recipients during the 1992-1993 academic school year and comprise the B&B:93 base-year cohort.¹

As part of the NPSAS data collection, RTI interviewed students about their college experiences and the ways in which they were financing college. Additionally, RTI collected student aid records from their institutions, including their Student Aid Report, their Financial Aid Need Analysis Form, and their Comprehensive Financial Aid Report. This data from NPSAS for the 1992-1993 graduates serves as base-year information. The cohort was re-interviewed in 1993-1994, approximately one year after they graduated from college and then again in 1997, approximately four years after they graduated from college.

For the analysis presented here, we included only sample members who were single and never married when they graduated from college and who had complete information on student loan debt and the date of first marriage between the 1993 and 1997 interviews. Approximately 9,880 sample members meet these criteria. As the focus of this analysis is the life course opportunities and challenges unique to young adulthood, we excluded 470 sample members who were older than 27 at the time of bachelor's degree receipt (and therefore older than 30 – an arbitrary, but often used cutpoint for young adulthood – at the time of the 1997 interview). Additionally, we excluded 40 cases that lacked information on gender, a key variable used in the analysis. The final analytic sample includes 9,380 bachelor's degree recipients; 5,120 females and 4,260 males.

The B&B:93 sample is drawn using a stratified cluster design, in which postsecondary institutions were initially selected within geographic strata, organized by zip code and state, and then stratified by control (i.e., public, private, etc.) and degree offering (less-than-two-year school, two to three-year school, etc.). Therefore, we used survey (*svy*) commands in STATA which use Taylor-series linearization methods to produce correct standard errors for samples that were drawn using a stratified cluster design (StatCorp 2005). All point estimates are weighted to compensate for unequal probability of selection into the B&B:93 sample and to adjust for nonresponse bias. With this weighting, the results presented here generalize to 1992-1993 bachelors degree recipients who were never married and who were younger than 27 at the time of bachelor's degree receipt.

Measures

¹ The sample sizes are approximate because restricted-use data are used. In accordance with NCES standards, exact sample sizes from restricted-use data files cannot be published unless the data are perturbed in some way. The

The Transition to Marriage. For this analysis, the dependent variable is the timing of first marriage after earning a bachelor's degree based on the month in which they married. The unit of analysis is person-months. Exposure to the risk of marriage begins the month the sample member earned a bachelors degree (which is May 1993 for most graduates), and extends through spring-summer of 1997 (approximately four years, or 48 months after degree completion).² The dependent variable is coded 0 for all months in which the sample member is single and 1 for the month in which s/he marries. As is typical in event history modeling, individuals are removed from the risk set once they marry (i.e., experience the event) and no longer contribute person-months to the analysis. Individuals who were still single by the 1997 interview are censored. During the risk period, approximately 29.2% of the analytic sample transitioned into marriage.

Student Loan Debt. Student loan debt is constructed two ways: (1) as a categorical variable indicating total student loan debt status upon completion of the bachelor's degree; and (2) as a time-varying measure of the remaining balance of student loan debt across the 48 months following the completion of a bachelor's degree. These measures are based on a number of sources of information: total debt at the time of graduation, monthly payment amounts, and periods of deferment, default, and forbearance. The total amount of student aid obtained from federal, state, or institutional loans, obtained as part of the NPSAS financial aid records collection, serves as the baseline total debt facing the student at the time of graduation. Information from the National Student Loan Data System abstracted as part of the 1997 data collection was used to identify monthly payment amounts and when applicable, loan pay-off dates.

perturbation approach taken here was to round the exact sample sizes of cells to 10s or 100s.

The categorical measure of total student loan debt status upon completion of the bachelor's degree classifies sample members as having no loan debt, low debt (less than \$9,000), and high loan debt (\$9,000 or greater). The cut point for low and high was determined by using the median debt amount among those who had debt. In preliminary analyses, we tested different cut points and all of them produced similar results. In the analytic sample, 54.3% had no debt, 23.2% had low debt, and 22.5% had high debt.

The time-varying measure identifies the gradually diminishing amount of student loan debt left to pay each month, starting the month after the sample member earned a bachelor's degree and extending through spring-summer of 1997 (e.g. the period of risk for the dependent variable). All monthly payments begin six months after bachelor's degree receipt, the standard grace period extended to graduates before loan repayment is required to begin. For example, if a sample member graduated in May 1993, owed \$9,000, and had a monthly payment amount of \$100, each of their person-months would be coded \$9,000 from June 1993 to November 1993, and then \$8,900 in December 1993, \$8,800 in January 1994, \$8,700 in February 1994, and so on. Among those with debt in the analytic sample, the average total amount was \$10,526 and the average total monthly payment amount was \$157. All values of this time-varying measure were divided by 1,000. This was done so that the coefficients from the multivariate models can be interpreted as the effect of an increase or decrease of \$1,000 in loan debt, which is more central to loan disbursement practices than discerning the effect of an additional 10 or 100 dollars.

There are three instances that can alter the "diminishing" level of loan debt owed: deferment, default, and forbearance. Deferment refers to the postponement of loan payment due to graduate school enrollment, economic hardship/unemployment, disability, or public service

² The exact period of exposure varies slightly for each respondent as the 1997 interviews took place between April and July.

(i.e. Peace Corps, military, etc.). 19.2% of those in the analytic sample who had loan debt deferred their loan payments. When loans are deferred, they do not accrue interest. Therefore, for sample members who defer their loans, their total loan debt remains unchanged during their period of deferment. If sample members continued on to graduate school and accrued further student loan debt, this additional debt amount was added to the outstanding total on the first month following graduate school exit and was granted a six month grace period before repayment began.

Those who are unable to continue paying back their loans and stop doing so are in default, which carries with it severe sanctions. This can be avoided by receiving forbearance, which is a postponement granted by the owner of the loan. Unlike deferment, when loans are in default or forbearance, they accrue interest, thus gradually increasing the total amount owed. Using information from the College Board on historical student loan interest rate averages, we recalibrated the monthly values for those who were in default or forbearance to reflect the increase due to interest accrual. Among those with student loan debt in the analytic sample, 2.4% went into default and 3.3% were granted forbearance.

Control Variables. In all multivariate analyses, we include a set of time invariant controls for age, race/ethnicity, sex, parental education, grade point average, types of postsecondary institutions attended (two-year v. four-year) and expectations for post-baccalaureate education. To capture the effects of debt apart from periods of deferment, default, and forbearance, which are often accompanied by graduate school enrollment (for those who defer) and unemployment (for those who default or enter forbearance), we include a time-varying measure of enrollment-employment status. For each person-month, the sample member is classified as enrolled,

employed, both enrolled and employed, and neither enrolled nor employed. We also include time-invariant dummy variables for the sample members' state of residence at the time of bachelor's degree receipt. These state "fixed effects" remove the potentially confounding effects of state characteristics such as their financial aid, welfare, and labor policies that may influence both financial aid awards as well as family formation decisions.

One of the major limitations of B&B:93 is that it lacks information on the sample members' income histories. In theory, student loan debt should influence family formation decisions inasmuch as it impinges upon an individual's resource flow. For example, a person earning \$35,000 a year should feel the effect of a \$400 monthly student loan bill more than a person earning \$65,000 a year with the same monthly repayment amount. In other words, student loan debt is a burden only *relative* to the person's current earnings.

To account for this in the present analysis, we use three time-invariant measures of earning potential during the period of risk: annual income during the first year out of college, field of study, and school sector (private v. public). Income during the first year of college captures economic resources available to young adults during the crucial first year out of college, when undergraduate loan debt is at its highest. Field of study and school sector are used as proxies for the type and/or quality of human capital graduates bring to their employers, which is typically correlated with earnings growth over time. On average, students who major in business, math, and engineering earn more than their peers who major in the social sciences and the humanities (Fitzgerald 2000), and graduates of private schools earn more than their public school peers (Brewer, Eide, and Ehrenberg 1999).

Because there is a large volume of literature that examines their relationship with family formation and because they are not central to the research questions, the control variables used in

the present analysis are not reported in the tables or reviewed in the discussion. The construction of these variables and their univariate distributions are presented in Appendix A.³

FINDINGS

Table 1 shows the percentage of sample members who were ever married within four years of high school graduation by debt status at the time of finishing college. By and large, marriage rates do not differ across these aggregate categories. In the full sample, 30.7% of those with high debt married within four years of degree completion, compared with 27.5% of those with low debt and 29.4% of those with no debt. These estimates were comparable for both men and for women. There were no significant differences among the different categories of debt burden.

[Table 1 about here]

As a first look at the relationship between student loan debt and family formation, these comparisons show that those leaving college with high debt are no more or less likely than their peers with low or no debt to have entered marriage within four years of graduation. However, these estimates do not capture the dynamics of loan debt, which changes over time for almost all young adults. For 19.2% of sample members, their payments were deferred and in cases where they went to graduate school, their total loan debt often increased between the end of college and four years out. Additionally, 5.7% of the sample had defaulted on their loans or went into forbearance, which steadily increases the total amount owed via interest accrual. The rest of the sample saw their debt totals decrease with each passing payment. Moreover, this aggregate glance at rates of marriage does not convey *when* youth got married: some may have gotten

³ In accord with NCES' policy of nondisclosure of potentially individual-identifying information, the distributions of the state dummy variables are not shown in Appendix A.

married immediately after graduation when debt burden is at its highest, or later on when they have their finances under control or even paid-off. Whether marriage happened earlier or later during this time period has implications for discerning which of the perspectives – economic independence or reverse dowry – is most appropriate.

To account for these dynamic conditions, we estimated a series of discrete-time hazard regression models predicting the odds of first marriage. Although time to first marriage is continuous, we use a discrete time hazard model because the data are grouped into discrete intervals (e.g. months). The hazard of the event from time t to time $t + 1$ is assumed to be constant while the hazard may vary across intervals. For a given covariate, the change in the baseline hazard is given by $\exp(\beta)$. The exponentiated parameters, $\exp(\beta)$, or odds ratios are presented in Table 2. Odds ratios greater than 1 represent a positive effect on the odds of first marriage while odds ratios less than 1 signify reduced odds of first marriage. The table includes the results for six separate models. The models are estimated for the full sample and then disaggregated by sex. For each group, the model is estimated two ways: 1) including the time-varying measure of student loan debt and the time since bachelors degree receipt (in months); and 2) including the time-varying measure of student loan debt, the time since bachelors degree receipt (in months), and all control variables listed earlier in the data and methods section (and in Appendix A).

[Table 2 about here]

The first column shows the results for the full sample. The top panel shows the estimates for the models without controls and the bottom panel shows the estimates for the models with controls. In both models, the odds ratio for time since bachelors degree receipt is 1.03 and significant at $p < .01$, indicating that with each passing month since graduating college, the odds

of getting married rise by 3%. Without controls, the odds ratio for total debt is significant at $p < .05$. When adding the controls, it remains marginally significant at $p < .10$. The magnitude of the odds ratio (0.99) is the same in both models, and indicates that an increase of one thousand dollars in student loan debt reduces the odds of first marriage by 1%.

To get a more meaningful sense of this relationship, consider two graduates equal on all of the covariates in the model, one at the 25th percentile of the total student loan debt distribution (\$4,500) and the other at the 75th percentile of the total student loan debt distribution (\$14,000). Based on the difference in total debt amounts ($\$14,000 - \$4,500 = \$9,500$), the former is 9.5 percent more likely to get married than the latter. This lends support to the reverse dowry perspective: higher levels of student loan debt are associated with reduced odds of entering into marriage in the young adult years.

Does this relationship vary by gender? In reviewing the findings from previous research on economic stability and marriage, there were distinct patterns regarding gender. In cases where economic resources were positively associated with marriage, on average the relationship was stronger for men than for women. While we are not directly exploring economic resources, we are assessing a strain on economic resources, and therefore we might expect to see complementary results. Therefore, we disaggregated the results by gender in the 2nd and 3rd columns of table 2. The magnitude of the odds ratios for total loan debt is the same in these models as they are in the models based on the full sample. However, they are significant only in the female models, suggesting that loan debt acts as a reverse dowry for females and not for males. Women facing high levels of student loan debt are less likely to marry than are their peers with lower levels of debt or no debt at all. This is not the case for men.

To get a clearer sense of how these relationships vary by gender, we constructed life-table survival curves for each of the debt status categories based on the full models separately for women and for men, shown in figures 1 and 2 respectively. Both figures illuminate the relationships detected in the model: Those with no debt are more likely to enter marriage than their peers with low levels of debt, who are in turn more likely to enter marriage than their peers with high levels of debt. For both women and men, these survival curves remain near 1 during the first 8 months after graduation, indicating that marriage is rare for all student loan debt levels in the months immediately following degree receipt. After the 8 month mark, however, there is a divergence. At this time, both men and women begin the transition to marriage, though it is accelerated for women: All of the predicted survival curves for men, regardless of debt status, are less steep than are the survival curves predicted for women.

[Figures 1 & 2 about here]

By two years out of college (24 months), there are stark differences between the sexes. Among those who finished their undergraduate degrees debt-free, nearly two-thirds of women were married, compared with only about 15% of men. Of those who carried with them a low amount of debt, 24% of women were married compared with only 5% of men. Therefore, while we see an overall negative relationship between loan debt and the odds of first marriage, this relationship is much more pronounced for women than for men.

Lastly, we explored whether the relationship between loan debt and marriage was contingent upon time, with the expectation that any relationship should attenuate with each passing month. To test this proposition, we re-estimated the full models shown at the bottom of Table 1 and included the multiplicative interaction term: Months Since Bachelor's Degree \times

Total Loan Debt Remaining. The odds ratios for the main effects and for this interaction term are shown in table 3 for the full sample as well as for women and men separately.

[Table 3 about here]

If the negative effect of student debt fades with time, we would expect the odds ratio for the interaction term to be significant and greater than 1. In all three models, $\exp(\beta) = 1.01$ for the interaction term and is significant, indicating that, as predicted, the relationship between student loan debt and the transition to first marriage is contingent on time. The negative relationship is strongest immediately after graduating from college and becomes less pronounced with each passing months. This is the case for the full sample, as well as women and men separately. Taken together, these findings highlight a dynamic process whereby the weight of student loan debt changes over time along with the probability of first marriage. The implications of which, is a topic we now turn.

CONCLUSION

One of the most consistent relationships in the social demographic literature is the one between educational attainment and family formation: those with higher levels of education tend to get married and have children at later ages than do their less educated peers (see for example Macunovich 1996; Thornton, Axinn, and Teachman. 1995). This line of inquiry tends to focus on the conflict among roles, such as student-spouse-parent in predicting marriage or childbearing; or the human capital “consequences of educational attainment” for making decisions about careers and family, whereby more ambitious occupational aspirations may prove incompatible with family roles. The present study suggests that the economics of how education is financed may be an increasingly important dimension of this relationship, particularly as rates of student loan

debt are on the rise.

In accord with past research which finds that economic strain impedes (rather than facilitates) the transition to marriage (Clarkberg 1999; Oppenheimer, Kalmijn, and Lim 1997; Teachman, Polonko, and Leigh 1987; Xie, Raymo, Goyette, and Thornton 2003), we find that student loan debt acts in a similar way. Specifically, my analysis shows that an increase of one thousand dollars in student loan debt reduces the odds of first marriage by 1% among bachelor's degree recipients. In contrast to classical economic ideas about the utility maximization function of marriage, the financial weight of monthly loan repayments acts as a reverse dowry, impeding family formation in the years immediately following college graduation.

While this relationship is evident for the sample at large, we find that it is more salient among women. Once disaggregating the sample by sex and applying a rigorous set of control variables, the negative relationship between remaining debt and the odds of first marriage held for women only. Additionally, the estimated survival curves from these models are more pronounced for women than for men – suggesting that women are uniquely affected by their decision to undertake loans to finance their education.

Though establishing causality between education and family formation is fraught with methodological challenges, most researchers agree that the opportunity for higher paying, higher skill jobs available to college-educated women has attenuated some of the draw toward marriage. With more resources at their disposal than their counterparts in previous generations, educated women today have the luxury to firmly establish their careers and to take their time to carefully select a partner before getting married. However, as my analysis suggests, this period of career development and courtship may also be accentuated by a strain on resources – particularly those brought on by student loan repayment. Indeed, women may be waiting until they find the right

job and the right mate, but they may also be waiting until they have their financial situation under control.

Given other studies which find that women, and not men, prolong marriage when they are faced with limited economic resources, it is not altogether surprising to see similar patterns extend to loan repayment. On the flipside, though, it is intriguing that this relationship is far weaker for men, who are traditionally the ones who assume the role of breadwinner in marriage. Any strain on resources brought on by student loan debt does not appear to thwart men's plans to marry in years immediately after college. While deciphering exactly why this is the case is beyond the scope of this project, it could be that men expect more financial returns from their jobs and/or a quicker move up the company ladder than do women – expectations that accord with long-seeded employment trends reflecting gender inequality in employment.

Though as a whole these findings highlight the life course consequences of relying on financial aid to shoulder the cost of college, they are most evident in the years immediately following college graduation. With each passing year, the reverse dowry effect of loan repayment attenuates. As adulthood progresses and the loan balance shrinks, the financial burden subsides and the salience of loan repayments in family formation decisions diminishes – a dynamic not captured in previous research which relies on cross-sectional comparisons of single and married young adults (Chiteji forthcoming)

In closing, the news reports cited in the beginning of this paper that indict student loan debt as a mechanism altering the course of the young adult years are not without merit. Young adults shouldering loan debt face a host of financial hurdles upon graduation, which for most includes securing a job and establishing financial and residential independence from their parents. Once the six-month grace period wears off and loan repayments begin, the direct costs

of their education begin to factor into their decision making. This financially fragile time, at least in the short term, precludes marriage. Social demographic research has long showed that college graduates delay family formation; here we see that college financing is another dimension of this process – a dimension that is likely to become more salient as more young adults are reaching their 30's with more loan debt than their counterparts in previous generations.

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Table 1. Percentage Ever Married by Sex and Student Loan Debt

	Full Sample	Female	Male
No Debt	29.4	30.4	28.2
Low Debt	27.5	29.4	25.3
High Debt	30.7	31.7	29.5
N	9,380	5,120	4,260

Table 2. Odds Ratios from Discrete Time Hazard Regression Models of Timing to First Marriage

		Full Sample	Females	Males
Reduced Models (no controls)	Total Loan Debt Remaining (in thousands)	0.99 *	0.99 **	0.99
		(.003)	(.004)	(.005)
	Months Since Bachelor's Degree	1.03 **	1.03 **	1.03 **
		(.002)	(.003)	(.004)
	Log-likelihood	-16,192.5	-9228.5	-6954.8
Full Models (with controls)	Total Loan Debt Remaining (in thousands)	0.99 †	0.98 **	1.00
		(.005)	(.0008)	(.006)
	Months Since Bachelor's Degree	1.03 **	1.03 **	1.04 **
		(.002)	(.003)	(.004)
	Log-likelihood	-15,909.2	-8,983.8	-6,804.2
N		9,377	5,115	4,262

† $p < .10$ * $p < .05$ ** $p < .01$

Note: The full models control for age, race/ethnicity, sex, parental education, grade point average, types of postsecondary institutions attended, expectations for post-baccalaureate education, enrollment-employment status, state of residence, earnings, field of study, and school sector.

Table 3. Odds Ratios from Discrete Time Hazard Regression Models of Timing to First Marriage

	Full Sample	Females	Males
Total Loan Debt Remaining (in thousands)	0.96 ** (.011)	0.95 ** (.004)	0.96 * (.017)
Months Since Bachelor's Degree	1.03 ** (.003)	1.03 ** (.003)	1.03 ** (.004)
Total Loan Debt Remaining (in thousands) × Months Since Bachelor's Degree	1.01 ** (.000)	1.01 * (.000)	1.01 ** (.000)
Log-likelihood	-15,885.3	-8,980.2	-6,799.2
N	9,377	5,115	4,262

† $p < .10$ * $p < .05$ ** $p < .01$

Note: All models control for age, race/ethnicity, sex, parental education, grade point average, types of postsecondary institutions attended, expectations for post-baccalaureate education, enrollment-employment status, state of residence, earnings, field of study, and school sector.

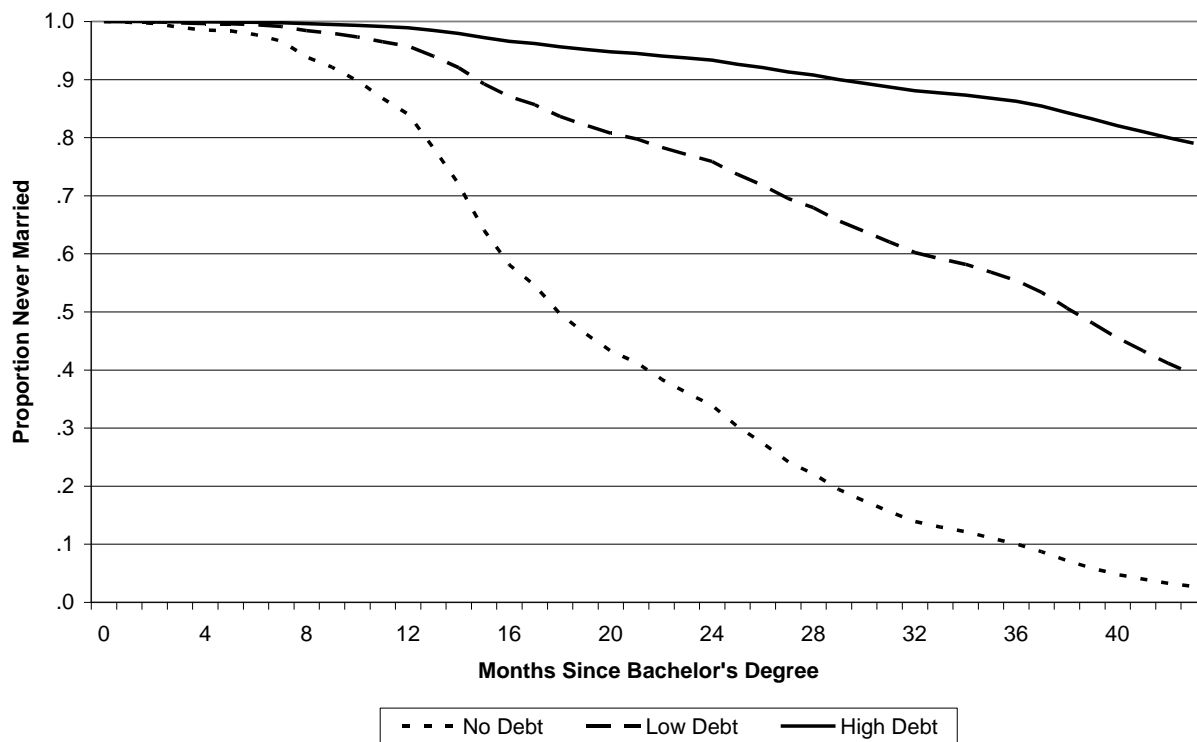
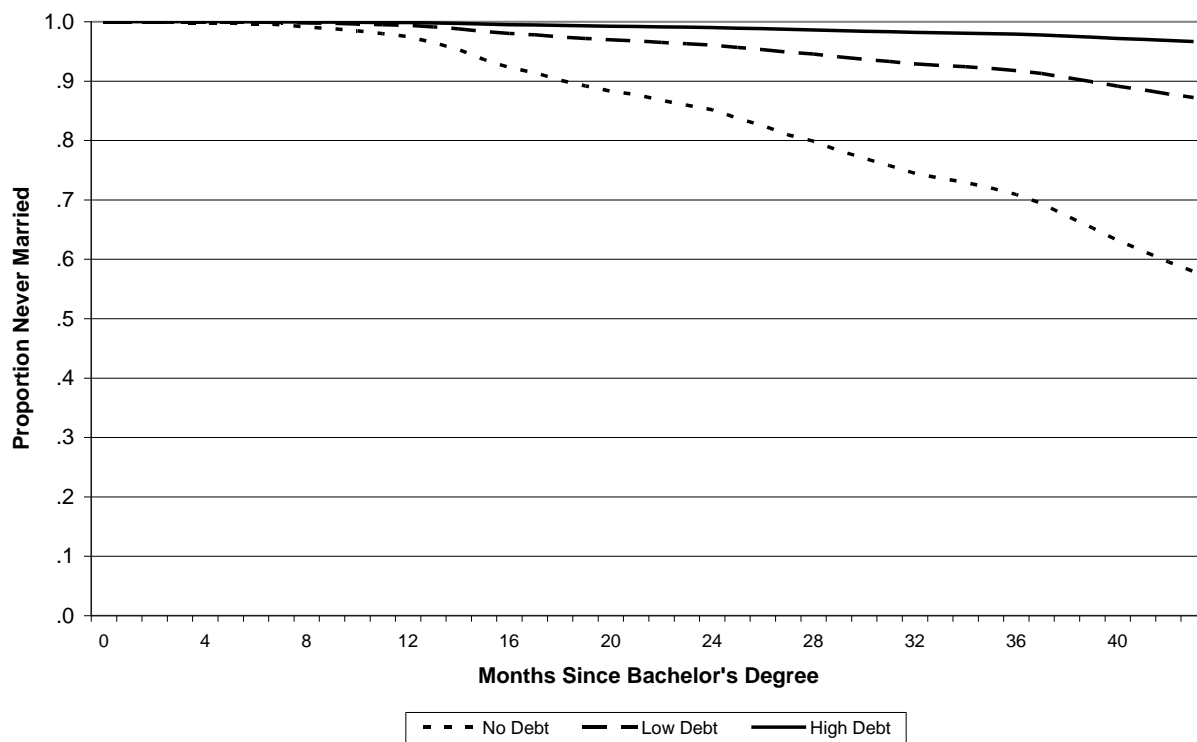
Figure 1. Predicted Survival Curves for Women, by Student Loan Debt

Figure 2. Predicted Survival Curves for Men, by Student Loan Debt

Appendix A: Control Variables

Variable Description	Categorical Construction	Weighted Mean or Proportion
Continuous measure of the respondent's age at the time of bachelor's degree receipt in years	N/A	22.4
Categorical construction of the respondent's race/ethnicity	American Indian	.00
	Asian	.05
	Black, Non-Hispanic	.06
	Hispanic	.05
	White, Non-Hispanic	.84
Categorical construction of the respondent's sex	Female	.53
	Male	.47
Categorical construction of the highest level of education of the respondent's parents	High school diploma or less	.22
	Some college or Associate's degree	.17
	Bachelor's degree	.26
	Graduate or professional degree	.30
	Missing parent's education	.05
Continuous measure of the respondent's final postsecondary grade point average	N/A	3.05
Categorical construction of the types of postsecondary institutions attended by the respondent	Four-year school only	.78
	Two-year then four-year school	.22
Categorical construction of the respondent's expectations for post-baccalaurate education	Expects only a bachelor's degree	.20
	Expects a graduate degree	.80
Time-varying categorical construction of the respondent's monthly enrollment-employment status	Both school and work	.14
	School only	.09
	Work only	.71
	Idle	.06
	Missing status	.00
Continuous measure of annual earnings for the respondent's job held in April 1994	N/A	23,906
Categorical measure of the respondent's field of study	Business and management	.18
	Education	.12
	Engineering	.06
	Health professions	.06
	Public affairs/social services	.03
	Biological sciences	.07
	Mathematics and other sciences	.06
	Social science	.12
	History	.02
	Humanities	.10
	Psychology	.04
	Other	.14
Categorical measure of the sector of the respondent's postsecondary institution	Public	.65
	Private	.35