Mate Selection in America:
Do Spouses’ Incomes Converge When the Wife Has More Education?

DISSERTATION

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Abstract

The reversal of the gender gap in education has reshaped the U.S. marriage market and could have far-reaching consequences for marriage and family lives. As women increasingly marry men with less education than themselves, does this imply greater economic gender equality in marriage? My dissertation takes a life course approach to answer this question. First, I examine gender asymmetry in educational and income assortative mating patterns among newlyweds. I use log-linear models to analyze data from the 1980 U.S. Census and the 2008–2012 American Community Surveys. I find that between 1980 and 2008–2012, educational assortative mating reversed from a tendency for women to marry up to a tendency for women to marry down in education, whereas the tendency for women to marry men with higher incomes than themselves persisted. Moreover, in both time periods, the tendency for women to marry up in income was greater among couples in which the wife’s education level equals or surpasses that of the husband than among couples in which the wife is less-educated than the husband. The findings suggest that men and women continue to form marriages in which the wife’s socioeconomic status does not exceed that of the husband.

Second, I investigate how educational assortative mating shapes husbands’ and wives’ income trajectories over the course of marriage. I use multilevel dyad models to analyze data from the National Longitudinal Survey of Youth 1979 (NLSY79). Educational assortative mating is captured by three types of educational pairings of...
spouses: educational hypergamy in which the wife is less educated than the husband, educational homogamy in which both spouses have same levels of education, and educational hypogamy in which the wife is more educated than the husband. I find that change in husbands’ income with marital duration was similar regardless of educational pairings of spouses, whereas change in wives’ income varied by educational pairings of spouses such that wives in educational hypogamy exhibited more positive change in income over the marital life course. The findings suggest that it remains important for husbands to bring income into the family no matter what educational levels they have relative to their wives, whereas the rise in women’s education and in prevalence of educational hypogamy likely protects women from earning less after marriage.

Lastly, I examine how educational assortative mating shapes patterns of female breadwinning status over the course of marriage. I use group-based trajectory models to analyze data from the NLSY79. I find substantial movement in and out of the primary breadwinner role by wives across marital years and great heterogeneity in trajectories of female breadwinning status across couples. In addition, educational assortative mating plays a role in shaping patterns of female breadwinning status: educationally hypogamous couples are less likely than educationally homogamous or hypergamous couples to follow the traditional trajectory characterized by virtually no chance of achieving a female breadwinning arrangement over the first twenty years of marriage.

Overall, through nuanced analyses of educational assortative mating and income dynamics in couples over the life course, my dissertation advances understanding of consequences of the gender-gap reversal in education for gender equality in marriage.
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Fields of Study

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Chapter 1: Introduction

Women have made greater gains in educational attainment than men over the past few decades in the United States. Women lagged behind men in college completion before the 1980s, but since 1982, women have overtaken men in college graduation rates (Buchmann & DiPrete, 2006). The percentage of bachelor’s and advanced degrees conferred to women has continued to increase such that by 2013 women earned about 60 percent of bachelor’s and master’s degrees and half of all doctoral degrees (Digest of Education Statistics, 2015; DiPrete & Buchmann, 2013). Women’s gains in education have resulted in significant changes in marriage patterns. In 2012, 21 percent of married women had spouses who were less educated than they were—a threefold increase from 1960 (Wang, 2014).

The implications of the gender-gap reversal in education for marriage and family lives have recently received growing scholarly attention (Esteve, 2012; Klesment & Van Bavel, 2015; Schwartz & Han, 2014). In addition, the media and popular press are asking what this trend toward wives being more educated than their husbands means for American families (Luscombe, 2014). As wives increasingly have education equal to or surpassing that of their husbands (Schwartz & Mare, 2005), does this imply greater economic equality between husbands and wives in American families? As women’s earnings potential (implied by their educational attainment) increases, do they choose
spouses on the basis of “love” rather than “money?” In addition, how does the educational pairing of spouses (in other words, one’s own educational attainment relative to that of one’s spouse) shape husbands’ and wives’ incomes over the course of marriage? Does women’s higher levels of education relative to their husbands translate into increased likelihood of wives assuming and maintaining the breadwinner role in marriage? In answering these questions, my dissertation offers an empirical assessment of gender asymmetry in mate selection patterns and the extent to which changes in gender equality in public arenas, such as education, has spilled over into personal relationships and reshaped gender relations and power dynamics among heterosexual couples in American marriages. Meanwhile, it sheds light on whether women maximize their earning capabilities after marriage given their superior educational credentials. In light of the rising economic insecurity in the United States (Western et al., 2012), understanding whether both spouses are able to maximize their incomes has far-reaching consequences for the well-being of married couples, their children, and American society.

My dissertation focuses on education and income—two key indicators of socioeconomic status that are also major factors in determining the pool of potential spouses for an individual (Blossfeld, 2009; Buss et al., 2001). It examines the complex interplay between the educational pairing of spouses and the evolution of their relative incomes across their married lives. Specifically, I address three questions: 1) How does education interact with income to shape patterns of who marries whom? 2) How does the educational pairing of spouses influence husbands’ and wives’ income trajectories over the course of marriage? 3) How does the educational pairing of spouses shape the
trajectory of change in female breadwinning status over the marital life course? Drawing on three large-scale nationally representative datasets (specifically, the 1980 U.S. Census, the 2008–2012 American Community Surveys, and the National Longitudinal Survey of Youth 1979), my dissertation uses sophisticated statistical methods (specifically, log-linear models, longitudinal dyad models, and group-based trajectory modeling) to empirically answer the aforementioned questions.

Contributions of Research

My dissertation fills important research gaps. First, it breaks new ground by investigating how education and income interact to shape assortative mating patterns. Assortative mating (i.e., who marries whom) has received substantial scholarly attention (for reviews, see Blossfeld, 2009; Kalmijn, 1998; Schwartz, 2013). Assortative mating patterns have implications for social boundaries across groups, economic equalities among families, and intergenerational transmissions of social and biological traits (Beller, 2009; Mare, 2016; Qian & Lichter, 2007; Schwartz 2010). Theory on marriage argues that individuals have preferences for mates but face constrained availabilities of potential spouses in the marriage markets (England & Farkas, 1986; Oppenheimer, 1988; Schwartz, 2013). Prior research on the educational pairing of spouses reveals that from 1960 to the early 2000s college graduates in the United States were increasingly likely to marry each other (Schwartz & Mare, 2005). We know little, however, about how men and women respond to today’s marriage market, where highly-educated women face a relative decline of similarly-educated men. The independence hypothesis posits that as women’s labor force participation increases, men increasingly emphasize earning power
in evaluating potential spouses while women attach less importance to a mate’s economic resources (Oppenheimer, 1988). Yet social exchange theory predicts that women may value other traits more if they tend to marry men with less education (Merton, 1941); they may marry up in other aspects such as income. Hence, given a relative decline of similarly-educated men and a persistent gender gap in earnings (Blau & Kahn, 2007), women may seek to maximize gains from marriage by evaluating potential spouses more on the basis of income rather than education. In testing these two theories, my dissertation sheds light on the extent to which the remarkable advances in women’s educational attainment have transformed women’s socioeconomic positions relative to their husbands and thus redefined gender roles in the family. By examining how income and education jointly shape assortative mating patterns, my dissertation advances prior work toward a more comprehensive understanding of the gendered and multidimensional nature of mate selection and also contributes to the scholarly debates about whether and to what extent changes in gender inequality in education and paid work spill over into intimate heterosexual relationships and impact who marries whom (England, 2010; 2011; Graf & Schwartz, 2011; Schwartz & Han, 2014).

Second, using a longitudinal and dyadic approach to investigating long-term trajectories of both husbands’ and wives’ incomes, my dissertation advances prior research that examines associations between spouses’ income from a static perspective by using cross-sectional data and assessing couples at only one point in time (Cancian & Reed, 1999; Schwartz, 2010). As longitudinal data become increasingly available, family scholars have called for applications of the life course perspectives to studying families
over time (Bengtson & Allen, 2009). My dissertation draws on the life course perspective to advance research on educational pairings and economic well-being of spouses. The life course perspective draws attentions to continuity and change in individuals’ employment and family experiences over the life course and recognizes the heterogeneity in marital relationships, life course experiences, and income trajectories (Elder, 1975). In addition, the life course perspective suggests how the “linked lives” of husbands and wives influence trajectories of change in spouses’ incomes over time (Elder, 1998; Elder, Johnson, & Crosnoe, 2003). Rather than measuring income at only one point in time, my dissertation tracks change in income over the course of marriage for each spouse among married couples. In addition, recognizing the importance of heterogeneity in income trajectories and the importance of linked lives between spouses, my dissertation further investigates how educational pairings of spouses at marriage, that is, educational assortative mating, are related to income dynamics in couples. This dynamic and dyadic approach allows me to identify factors that account for changing correlations between spouses’ incomes over their married lives. For example, life events such as a job loss or childbearing may decrease one spouse’s income and in turn, lead to greater income contributions from the other spouse. Couples make deliberate family and career decisions, such as the wife “opting out” of the workforce after childbirth. Moreover, gender discrimination in the labor market, as evidenced by the wage penalty experienced by employed mothers and the wage premium enjoyed by fathers, also likely shapes family and career decisions of both spouses and in turn, the income gap between husband and wife (Budig & England, 2001; Killewald, 2013). Thus, my dissertation not only
reveals how men’s and women’s educational attainment relative to that of their spouses influences the long-term trajectories of their own incomes and the breadwinning arrangements in marriage, but also uncovers the mechanisms through which educational pairings of spouses influence husbands’ and wives’ economic positions by taking into account changes in employment and parental status over the course of marriage.

Third, my dissertation on educational pairing and income inequality in American families has broad social implications. Women’s economic dependency on their husbands contributes to women’s subordinate status and lower bargaining power in families as well as increased risk of falling into poverty after divorce or widowhood (England, 2003; Holden & Smock, 1991). By tracking the income dynamics of couples over time, my dissertation provides nuanced analyses of how women gain or lose resources relative to their husbands after marriage. Examining how women maintain greater economic power in the household also has implications for the well-being of their children, since wives are more likely than husbands to allocate economic resources to children, which in turn has positive consequences for child development (Lundberg et al., 1997). Ultimately, through understanding the interplay between educational pairing and income dynamics, we can gain valuable insight into the long-term consequences of women’s rising educational levels for the well-being of women and their children within and outside of marriage.

Organization of the Dissertation

The organization of the chapters is as follows. Chapter 2 investigates how men’s and women’s education and income jointly shape assortative mating patterns in the United States. I ask: 1) whether the patterns of educational and income assortative
marriage are symmetrical with respect to gender and 2) whether they have changed in recent decades when gender inequality in education and employment has changed substantially. To this end, I used data from the 1980 U.S. Census to examine educational and income assortative mating patterns among couples who married in 1979–1980, a period prior to the gender reversal in educational attainment. Then, using pooled data from the 2008–2012 American Community Surveys, I examined recent marriage cohorts in which wives likely have higher education levels than their husbands. Ultimately, my findings illustrate whether and how gendered features of partner choice in heterosexual marriages have changed in recent decades.

Chapter 3 takes a longitudinal and dyadic approach to examine how educational assortative mating (i.e., educational pairings of spouses at the time of marriage) shape trajectories of change in husbands’ and wives’ incomes over the marital life course. I analyze data from the National Longitudinal Surveys of Youth 1979 (NLSY79). The NLSY79 is a nationally representative sample of 12,686 young men and women who were 14–22 years old when they were first surveyed in 1979. The survey was conducted annually through 1994 and is currently conducted biennially. When the cohort was first surveyed, many respondents had just begun to transition from school to work and to get married. The cohort was 47–56 years old at the time of their 2012 interviews and approaching retirement age. Thus, these data provide a unique opportunity to study the income dynamics of baby-boomer couples over nearly their entire marital lives during which both partners were of active working age.
After examining income trajectories of each spouse, my dissertation investigates the long-term trajectories of change in spouses’ relative income in Chapter 4. With women’s rising educational attainment and income, much media and scholarly attention has focused on families in which wives are the primary breadwinners (Klesment & Van Bavel, 2015; Mundy, 2013; Munsch, 2015; Tichenor, 2005). While previous studies only assess the existence or persistence of wives’ income advantage over their own husbands at one point in time or within a relatively short period of time (e.g., for three or five years), Chapter 4 uses the NLSY79 data and applies a group-based trajectory method to examine trajectories of change in female breadwinning status over the marital life course. In addition, Chapter 4 further investigates how educational pairings of spouses at the time of marriage are related to the trajectories that couples follow. This chapter highlights the importance of a more dynamic conceptualization of breadwinning arrangements in marriage. Finally, in the concluding Chapter 5, I summarize the findings of each study and discuss the implications of women’s rise in education for gender equality in economic well-being in American heterosexual marriages.
Chapter 2: Gender Asymmetry in Educational and Income Assortative Marriage

Women have made greater gains in educational attainment than men over the past few decades in the United States. Currently, women earn about 60 percent of bachelor’s and master’s degrees and half of all doctoral degrees (DiPrete & Buchmann, 2013). Women’s gains in education have resulted in significant changes in marriage patterns. In 2012, 21 percent of married women had spouses who were less educated than they were—a two-fold increase from 1980 (Wang, 2014). Has the narrowing and eventual reversal of the gender gap in education led to the demise of the normative practice of women marrying men of higher socioeconomic status (i.e., hypergamy)? When they marry less-educated men, do women also marry men with lower incomes, thereby challenging the traditional breadwinning role of men in the family? In answering these questions, this paper offers a critical empirical investigation of gender asymmetry in assortative mating and presents a detailed picture of the state of gender equality in heterosexual marriages.

Women married to men with less education than themselves are often thought to challenge the traditional, male-dominant status in marriage (Kaukinen, 2004; Schwartz & Han, 2014). The previously non-normative arrangement—educational hypogamy (i.e., marriages in which the wife has more education than the husband)—has become more common (Schwartz & Mare, 2005). Does increasing educational hypogamy indicate a
shift away from the convention of mate selection that embodies male dominance? In this paper, I argue that an exclusive focus on educational assortative mating provides an incomplete understanding of mate selection patterns and overstates gender change in heterosexual marriages. This study advances prior work toward a more comprehensive understanding of the gendered and multidimensional nature of mate selection by examining how income and education jointly shape assortative mating patterns.

Compared with educational differentials between two spouses, men’s income advantage over their wives is more central to their identity as breadwinners and household heads (Tichenor, 2005). The smaller amount of money women bring into the household relative to their husbands contributes to women’s subordinate status and lower bargaining power in the family (England, 2003). Despite the importance of spouses’ relative income in shaping power dynamics between them (Bittman et al., 2003; Tichenor, 2005), research on income assortative mating has been scant.

Despite the decline and eventual reversal of the gender gap in education (DiPrete & Buchmann, 2013), a gender gap in pay persists: in 2011, median hourly pay of women was 84 percent that of men (Economic Policy Institute, 2012). On the one hand, women’s advantage in education may enable them to be more economically independent and thus put less emphasis on economic traits when evaluating potential spouses (Press, 2004). On the other hand, evidence suggests that men may still feel uncomfortable forming relationships in which they have lower status than their female partners (Fisman et al., 2006). This persistent gendered norm, as well as the gender pay gap, means that men—especially men who do not have an educational advantage over their wives—may marry
women with lower incomes than themselves in order to preserve their status and gender role expectations in marriage. Hence, by incorporating income into the analysis of assortative mating patterns, I can shed light on the extent to which the remarkable advances in women’s educational attainment have or have not transformed their socioeconomic positions relative to their husbands and redefined gender role expectations in the family.

This study investigates how men’s and women’s education and income jointly shape mate selection patterns in the United States. I ask: 1) whether the patterns of educational and income assortative marriage are symmetrical with respect to gender and 2) whether they have changed in recent decades when gender inequality in education and employment has changed substantially. To this end, I used data from the 1980 U.S. Census to examine educational and income assortative mating patterns among couples who married in 1979–1980, a period prior to the gender reversal in educational attainment. Then, using pooled data from the 2008–2012 American Community Surveys, I examined recent marriage cohorts in which wives likely have higher education levels than their husbands. Ultimately, my findings illustrate whether and how gendered features of partner choice in heterosexual marriages have changed in recent decades.

Theoretical Frameworks and Hypotheses

Assortative mating has received substantial scholarly interest (for reviews, see Blossfeld, 2009; Kalmijn, 1998; Schwartz, 2013). Individuals have preferences for spouses but face constrained opportunities in the marriage markets (Oppenheimer, 1988; Schwartz, 2013). Different theories have been developed to conceptualize the underlying
processes determining partner choice. In her “career-entry” theory, Oppenheimer (1988) applied job-search theory to mate selection and maintained that as women’s employment and labor force attachment increase, women are increasingly evaluated as potential spouses on the basis of their socioeconomic traits. Accordingly, men begin competing for highly-educated or high-earning women. At the same time, the deteriorating economic position of less-skilled men and the declining economic security of strict gender specialization where the husband is the single earner in the family would also lead to changes in men’s attitudes and behaviors in mate selection (Oppenheimer, 1994; 1997).

The United States has experienced changes in women’s economic roles since the 1980s: women’s employment has increased (England, 2010), occupational gender segregation and the gender pay gap have declined (Blau, Brummund, & Liu, 2013; Blau & Kahn, 2007; England, 2010), and strikingly, the gender gap in education has reversed from favoring males to favoring females (DiPrete & Buchmann, 2013). In light of women’s progress in education and employment in recent decades, the “career-entry” theory suggests the following hypotheses:

**Hypothesis 1**: Educational hypogamy in which the wife has more education than the husband increased between 1980 and 2008–2012; and

**Hypothesis 2**: Income hypergamy in which the wife has lower income than the husband decreased between 1980 and 2008–2012.

Previous studies on assortative mating patterns examine education and income separately. It is unclear how these two variables work together. As I elaborate below, drawing on an “uneven and stalled gender revolution” perspective (England, 2010) and social exchange theory, I hypothesize that husbands’ income advantage over their wives
would be more apparent among couples in which the wife has an education level surpassing or equal to that of the husband.

An “uneven and stalled gender revolution” perspective (England, 2010) posits that progress toward gender equality has been uneven. Compared with gender change in the world of paid work and education, change in heterosexual relationships has been much more limited. For example, men are still expected to propose marriage (Sassler & Miller, 2011), and the vast majority of women take their husbands’ surnames (Goldin & Shim, 2004). Mate preferences are still gendered such that women have a stronger preference for income than men (Hitsch, Hortaçsu, & Ariely, 2010). In addition, although men value potential wives’ economic roles more today than they did in the past (Buss et al., 2001), they still appear to hesitate to choose women whose status exceeds their own status (Bertrand, Kamenica, & Pan, 2015; England, 2011; Graf & Schwartz, 2011).

The “uneven and stalled gender revolution” perspective also points out that the progress toward gender equality in paid work has recently stalled, as measured by changes in women’s labor force participation, gender pay gap, and occupational sex segregation since the 1990s (Blau et al., 2013; Blau & Kahn, 2007; England, 2010). Similarly, U.S. attitudes toward egalitarian gender roles and the share of women who keep their surnames after marriage have changed little since the 1990s (Cotter, Hermsen, & Vanneman, 2011; Goldin & Shim, 2004). This stalling of progress toward gender equality suggests that the norm against marriages in which women have higher status than their husbands has changed little in recent decades.
In light of the rising female advantage in education, social exchange theory provides a theoretical basis to understand how individuals avoid status reversal in marriage via assortative mating. Social exchange theory shares the assumption underlying the economic model of marriage (Becker, 1981) that individuals make rational marriage decisions and marry only if the utility of marriage exceeds the utility of remaining single. It posits that individuals balance unequal traits through exchange to maximize their gains from marriage (Merton, 1941). Hence, when women marry down in education (i.e., marry men whose education is lower than their own), they may marry up in income (i.e., marry men whose income is higher than their own). Such balance between more-educated wives and higher-earning husbands should be welcomed by both men and women choosing marital partners. From women’s perspective, when searching for a spouse in a pool of less-educated men, women have more to gain if they choose men with higher incomes. After all, men do not need equivalent levels of education to have higher incomes than women. Even women, who work full-time, tend to earn less than men of comparable or less education (Institute for Women’s Policy Research, 2015). From men’s perspective, although men have placed more importance on the financial prospects of a potential spouse over time (Buss et al., 2001), they may value women’s high status only up to the point when women’s status exceeds their own status (England, 2011; Graf & Schwartz, 2011). For example, a speed dating study found that men did not value women’s intelligence or ambition when it exceeded their own (Fisman et al., 2006). Psychology experiments showed that men’s self-esteem was lower when their partners succeeded than when their partners failed, whereas women’s self-esteem was not affected
by their partners’ performance (Ratliff & Oishi, 2013). Although these studies did not directly test men’s reaction to their partners’ education or income, they suggest that men may avoid a potential spouse who has both higher education and higher income than themselves.

Overall, the “uneven and stalled gender revolution” perspective (England, 2010) and social exchange theory suggest the following hypotheses:

*Hypothesis 3a: The tendency for women to marry up in income is greater among couples in which the wife has more education than the husband than among couples in which the wife has less education than the husband.*

*Hypothesis 3b: The greater tendency for women to marry up in income when they marry down in education did not change between 1980 and 2008–2012.*

Additionally, among couples in which husbands and wives are equals with respect to education, husbands’ income advantage would help maintain their higher status relative to their wives. Moreover, I hypothesize that among couples who share the same education level, the tendency for women to marry up in income is likely to be greater at the lower end of the educational distribution. Despite recent declines in marriage rates especially among less-educated individuals (Cherlin, 2010), the symbolic importance of marriage remains high in that marriage has become “a marker of prestige” (Cherlin, 2004). Individuals from lower social classes require high economic security before entering marriage (Cherlin, 2004; Smock, Manning, & Porter, 2005). Because less-educated women tend to have poor economic prospects (Blau, 1998), they cannot afford to marry a man who also has poor economic prospects. In contrast, higher education provides women with higher earning power and helps level the playing field for women.
Gender inequalities in labor force participation, occupational segregation, and median hourly wage are less severe among the highly educated than among the less educated (Evertsson et al., 2009). Thus, highly-educated women have greater economic independence and are less dependent on finding husbands whose incomes exceed their own. At the same time, less-educated men are less willing than more-educated men to marry women who earn more than they do (South, 1991), because they hold more traditional gender ideologies (Davis & Greenstein, 2009). In light of these considerations, I propose the following hypotheses:

**Hypothesis 4a:** The tendency for women to marry up in income is greater among couples who share the same education level than among couples in which the wife has less education than the husband. This is especially likely if both spouses have low levels of education.

**Hypothesis 4b:** The greater tendency for women to marry up in income among couples who share the same education level did not change between 1980 and 2008–2012.

**Previous Research and the Present Study**

Among many traits that play a role in the choice of a spouse, sociologists have most often examined assortative marriage patterns with respect to education (e.g., Blossfeld, 2009; Mare, 1991; Schwartz & Mare, 2005). Education is multifaceted, reflecting cultural resources such as values, beliefs, and life styles as well as earnings potential (Bruze, 2011; Kalmijn, 1994; Sweeney, 2002). In addition, schools provide an institutional setting wherein individuals can interact and build romantic relationships with potential spouses (Kalmijn, 1998). Prior research on educational assortative marriage in the United States found that from 1960 to the early 2000s, men and women, especially
those at the top and bottom of the educational distribution, increasingly married spouses
with similar education (Schwartz & Mare, 2005).

Income assortative mating has received far less attention than educational
assortative mating. Yet, in recent decades, income may have become increasingly
important in the selection of marriage partners. The median age at first marriage has risen
substantially: between 1980 and 2011, it increased from 24.7 to 28.7 for men and from
22.0 to 26.5 for women (U.S. Census Bureau, 2011). Individuals wait until they attain
stable employment and income and even wealth (such as savings, a car, or a home)
before they get married (Edin & Kefalas, 2005; Schneider, 2011). As individuals marry
later, often after they have established their economic roles, they are more likely to
evaluate potential spouses on the basis of current incomes rather than future economic
prospects as proxied by educational attainment (Oppenheimer, 1988).

Prior studies examined associations between spouses’ earnings in prevailing
marriages, that is, all existing marriages at the time of a survey, and found a growing
resemblance in husbands’ and wives’ earnings (Cancian & Reed, 1999; Schwartz, 2010).
These studies did not, however, adequately assess the role of income in assortative entry
into marriage. Earnings change for both spouses after marriage (Cooke et al., 2009). The
associations between spouses’ earnings in prevailing marriages are based on couples at
various durations of marriage, and thus are the combined results of spousal resemblance
at the time of marriage formation and post-marriage divisions of household and market
labor between the spouses (Schwartz, 2010). In addition, the associations between
spouses’ earnings in prevailing marriages suffer from bias due to divorce, because spouses’ relative earnings influence the risk of divorce (Teachman, 2010).

In contrast, this study offers a precise account of the trends in assortative mating by examining education and income at the time of marriage among newlyweds in two time periods. Examining newlyweds is most suitable for investigating trends in assortative mating and the role of marriage markets in shaping who marries whom (Kalmijn, 1998; Schwartz & Mare, 2012). Analyzing newlyweds also avoids bias arising from marital dissolution and changes in traits after marriage. Appendix A shows that the degree of marital sorting on income and the share of couples in which the wife has more education or income than the husband were severely underestimated if prevailing marriages, as opposed to newlyweds, were examined.

To investigate the role of women’s wages in assortative mating, Sweeney and Cancian (2004) took an individual-level approach to examine the association between women’s premarital wages and the economic standing of the men they married. They found an increase between two cohorts of women in the positive correlation between women’s premarital wages and wages of their husbands, and therefore argued that women’s economic prospects became more important in determining their marriage prospects. Unfortunately, Sweeney and Cancian’s study (2004), along with other prior studies that indicated a positive correlation between spouses’ earnings (Cancian & Reed, 1999; Schwartz, 2010), failed to reveal the within-couple difference in earnings. A positive correlation between spouses’ income implies that high-earning individuals (both men and women) marry higher-earning spouses than low-earning individuals. In fact, a
correlation between spouses’ incomes can be strongly positive, even if most women marry men with higher levels of income than themselves (Kalmijn, 1998). Hence, we do not know whether mate selection has changed to the point where men and women no longer tend to form marriages in which the husband has higher income the wife. The present study departs from prior research by using log-linear models to investigate the prevalence of, and changes in, income hypergamy in which women marry men with higher incomes than themselves, net of gender differences and shifts in income distributions. This study thus evaluates how marriage is gendered from the very start by examining gender asymmetry in assortative mating.

Method

*Data and Measurement*

I used data from the 5-percent sample of the 1980 Census and the American Community Survey (ACS) 2008–2012 5-year sample. The data came from the Integrated Public Use Microdata Series (IPUMS) project at the University of Minnesota (https://usa.ipums.org/usa/). The 1980 Census and the ACS from 2008 to 2012 are well-suited for this research because they collected information on respondents’ age at first marriage (the Census) or whether respondents married within the past 12 months (the ACS), number of times married, and total personal income for the previous year. Thus, both datasets allowed me to examine newly-contracted first marriages and to obtain information on both spouses’ education and income at the time of marriage.

Given the focus on income, I limited my sample to working-age adults. Additionally, as marriage patterns may differ between native-borns and immigrants, I
only included couples in which both spouses were U.S.-born. In sum, I used a sample of U.S.-born couples in which both husband and wife were aged 18–55 years and married for the first time within approximately one year prior to the Census or ACS. Sensitivity analysis (available upon request) confirmed that results did not change if I included immigrants or used alternative age ranges. After excluding 462 couples in which either spouse had negative income or both spouses had zero income, the final sample sizes were 38,016 couples in 1980 and 37,686 couples in 2008–2012.

More than 80 percent of newlyweds were non-Hispanic white couples and supplementary analyses of white couples only yielded substantively identical results to those reported below. Assortative mating patterns might be different for racial/ethnic minority couples considering the differences across racial/ethnic groups in the gender gap in education, the retreat from marriage, the availability of economically suitable men, and the marriage pool influenced by the large influx of recent immigrants (Cherlin, 2010; DiPrete & Buchmann, 2013; Qian & Lichter, 2007, 2011; Schoen & Cheng, 2006). Sample sizes were too small to separately examine racial/ethnic minority couples, so I leave this task to future research. The goal of this paper is to provide a general account of gender asymmetry in assortative mating patterns among U.S. newlyweds.

Following Cancian and Reed (1999), I defined an individual’s income as his/her total pre-tax personal income from all sources for the previous year. I examined spouses’ income from all sources rather than their annual wage and salary earnings because the total income reflects individuals’ overall economic quality. On average, individuals’ wages and salaries constituted more than 90 percent of their own total income in each
time period. Moreover, results of analyses using wages and salaries were substantively the same as those using the total income.

Incomes in the 2008–2015 5-year ACS data file were inflated to 2012 dollars. To perform log-linear analysis (as elaborated below), I have to recode the continuous income measure into a categorical measure. To reduce zero cells while preserving adequate detail in spouses’ income, I classified each individual’s income by the decile (s)he occupied in the income distribution of the 1980 and 2008–2012 analytic samples, respectively. In other words, income deciles were defined by ranking all people in the period-specific analytic samples by their income. Thus, spouses were classified by time period based on their income relative to other people irrespective of gender.

I classified each spouse into one of the four education levels—high school or less, some college, college graduate, and advanced degree. This classification of educational attainment is somewhat different from that of past research (e.g., Mare, 1991; Qian, 1997; Schwartz & Mare, 2005), which typically included more detailed categories at the lower end of the educational distribution but lumped together bachelor’s and advanced degrees. In light of the reversal of the gender gap in higher education over the decades, I paid more attention to how highly-educated individuals looked for spouses in the changing marriage markets. Thus, I distinguished college graduates from individuals with advanced degrees. As a robustness check, I experimented with different classifications of educational and income levels (e.g., income quintiles and five education levels) and obtained similar results to those reported below. Taken together, I produced a five-way
table with 3,200 cells (10 income deciles for husbands × 10 income deciles for wives × 4 education levels for husbands × 4 education levels for wives × 2 time periods).

**Analytical Approach**

I used log-linear models to examine educational and income assortative mating. The chief advantage of log-linear models lies in their ability to estimate associations between spouses’ characteristics (e.g., education or income) while controlling for husband-wife differences in the marginal distributions of these characteristics as well as shifts in the marginal distributions (Kalmijn, 2010; Qian & Lichter, 2007, 2011; Schwartz & Mare, 2005; but see Rosenfeld, 2005 for a critique of log-linear models). The first set of models included only educational pairing of spouses. The second set of log-linear models added associations between spouses’ income. Finally, I examined how education interacts with income to shape assortative mating patterns.

To begin with, my basic model is

\[
\log(\mu_{ijklt} / t_{ijklt}) = \lambda + \lambda_{it}^{HE} + \lambda_{kt}^{WE} + \lambda_{jt}^{HI} + \lambda_{lt}^{WI} + \lambda_{ijl}^{HEHI} + \lambda_{ikl}^{WEWI},
\]

(1)

where \(HE\) is husband’s education \((i = 1, \ldots, 4)\), \(WE\) is wife’s education \((k = 1, \ldots, 4)\), \(HI\) is husband’s income category \((j = 1, \ldots, 10)\), \(WI\) is wife’s income category \((l = 1, \ldots, 10)\), and \(Y\) is period \((t = 1, 2)\). Thus, \(\mu_{ijklt}\) is the expected number of marriages between men with education \(i\) in income decile \(j\) and women with education \(k\) in income decile \(l\) in period \(t\). This model includes variations in the distributions of husband’s and wife’s education and income by year \((\lambda_{it}^{HE}, \lambda_{kt}^{WE}, \lambda_{jt}^{HI}, \lambda_{lt}^{WI}, \lambda_{ijl}^{HEHI}, \lambda_{ikl}^{WEWI})\), the associations between education and income for both husbands and wives and their variations by year \((\lambda_{ilk}^{HEHI}, \lambda_{jlt}^{WEWI}, \lambda_{ikl}^{HEHI}, \lambda_{jlt}^{WEWI})\), and all lower-order terms.
The 1980 Census is self-weighting, whereas the ACS 2008–2012 5-year sample contains weights to ensure that the multi-year sample is representative of the population over the entire 5-year period. I incorporated the weights by an offset $t_{ijkt}$, which is the inverse of the total weighted frequency of the cell divided by the unweighted cell count (Agresti, 2002: p. 391). To preserve the original sample size in the ACS sample, I rescaled the original weights so that the sum of the weights equaled the sample size (Schwartz & Mare, 2005). In 8.6 percent of cells with counts of zero (i.e., 276 out of 3200), I set $t_{ijkt}$ to 1 (Schwartz & Mare, 2005).

To test Hypothesis 1, I modeled associations between husband’s and wife’s education. I modeled the odds of educational homogamy and hypogamy relative to the odds of educational hypergamy by adding variable diagonal parameters (Qian, 1997) and a hypogamy parameter which was coded 1 if the wife had more education than the husband. Then I added interaction terms between year and the variable diagonal parameters and between year and the hypogamy parameter to model changes in educational assortative mating. The model becomes

$$\log(\mu_{ijkt} / t_{ijkt}) = \text{Model 1} + \gamma_{ik}^{O} + \gamma_{ip}^{P} + \gamma_{ik}^{O} \lambda_{t}^{Y} + \gamma_{ip}^{P} \lambda_{t}^{Y},$$

(2)

where $\gamma_{ik}^{O}$ is a set of parameter estimates for homogamy of each educational group ($O = 1$ when $i = k = 1, \ldots, O = 4$ when $i = k = 4$, and $O = 0$ otherwise), and $\gamma_{ip}^{P}$ is the education hypogamy parameter ($P = 1$ when $i < k$ and 0 otherwise). $\gamma_{ik}^{O} \lambda_{t}^{Y}$ and $\gamma_{ip}^{P} \lambda_{t}^{Y}$ estimate changes in the odds of homogamy and hypogamy, respectively, between 1980 and 2008–2012, net of shifts in the marginal distributions of husbands’ and wives’ education.
Building on the best-fitting model with educational assortative mating parameters, I added additional parameters to model income assortative mating, in order to test

*Hypothesis 2*. Income assortative marriage patterns are described by distance models. Distance models estimate the odds of intermarriage by the absolute difference between husbands’ and wives’ income deciles relative to the odds of income homogamy (Schwartz, 2010). To model gender asymmetry in income assortative mating, I constrained the cells in which wives were in a lower income decile than husbands into one income hypergamy parameter. The model becomes

\[
\log(\mu_{ijkl} / \tau_{ijkl}) = \text{Model 2} + \delta^D_{jl} + \delta^Q_q \lambda^Y_t + \delta^Q_q \lambda^Y_t ,
\]

(3)

where \(\delta^D_{jl}\) is a set of distance parameters indicating the absolute value of the difference between spouses’ income deciles \((D = |j - l|\) ranging from 0 to 9; nine dummy variables were created with \(j = l\) as the reference category), and \(\delta^Q_q\) is an income hypergamy parameter \((Q = 1\) when \(j > l\) and 0 otherwise). \(\delta^D_{jl} \lambda^Y_t\) and \(\delta^Q_q \lambda^Y_t\) represent changes in the odds of marriages that cross income boundaries and changes in the odds of income hypergamy, respectively, between 1980 and 2008–2012, net of shifts in the marginal distributions of husbands’ and wives’ income deciles.

Finally, to test *Hypotheses 3a, 3b, 4a, and 4b*, I examined how the gender asymmetry in income assortative mating differs by the educational pairing of spouses. I included interaction terms between the income assortative mating parameters and the educational homogamy and hypogamy parameters as well as changes in these interaction terms by year. The model is

\[
\log(\mu_{ijkl} / \tau_{ijkl}) = \text{Model 3} + \gamma^D_{ik} \delta^D_{jl} \lambda^Y_t + \gamma^P_p \delta^D_{jl} \lambda^Y_t + \gamma^Q_q \delta^Q_q \lambda^Y_t + \gamma^P_p \delta^Q_q \lambda^Y_t ,
\]

(4)
where the key parameters of interest are $\gamma_{1k}^{O} \delta_{q}^{O}$ and $\gamma_{P}^{P} \delta_{q}^{P}$ that examine the tendency for women to marry up in income among couples in which the wife has education equal to and greater than the husband, respectively, versus those in which the wife has less education than the husband.

Results

Descriptive Results

Descriptive results in Figures 1 and 2 show substantial changes in the distributions of education and income among newlywed men and women. Figure 1 shows that educational attainment increased for both spouses from 1980 to 2008–2012, but increased more for wives than for husbands. In 1980, about 12 percent of husbands and wives were college graduates, whereas in 2008–2012, about 30 percent of wives but only 26 percent of husbands had college degrees. The proportion of husbands with advanced degrees barely changed over the period, whereas the proportion of wives with advanced degrees more than doubled.

Figure 2 shows that income increased more rapidly for wives than for husbands. Percentages of wives in low income deciles declined whereas those in high income deciles increased. The opposite trend was true for husbands. Despite wives’ greater gains in income over the decades, wives were still underrepresented in higher deciles and overrepresented in lower deciles in both time periods. For example, less than 5 percent of husbands but over 15 percent of wives were in the lowest income decile (=1) in both time periods.
Figure 1. Percentage Distributions of Educational Attainment, By Gender and Year

*Note:* Totals may not sum to 100.00 due to rounding errors. Data were weighted in 2008–2012.
Figure 2. Percentage Distributions of Income Decile, By Gender And Year

*Note:* Data were weighted in 2008–2012. I present husbands and wives separately for clarity, but their income deciles were calculated based on the pooled sample of both sexes by time period. 1 = the lowest decile; 10 = the highest decile.
What are the implications of these changes for assortative mating? Table 1 shows that the percentage of couples in which the husband has more education than the wife declined from 21 percent in 1980 to 17 percent in 2008–2012, whereas the share of couples in which the wife has more education than the husband increased from 16 percent to 32 percent over the same period. In 1980 the husband was more likely to have more education, but in 2008–2012 the wife became more likely to be the more-educated spouse. From 1980 to 2008–2012, the share of couples in which the husband is in a higher income decile than the wife declined, whereas the share of couples in which the wife is in the same or a higher income decile relative to the husband increased. Notably, for most couples, husbands were in a higher income decile than their wives, regardless of the time period and the educational pairing of spouses. Overall, the descriptive results reveal a trend toward wives being more educated than their husbands coexisting with the traditional pattern of wives marrying higher-income husbands.
Table 1. Cross-Classification of Educational and Income Assortative Marriage, by Year

<table>
<thead>
<tr>
<th></th>
<th>Educational Assortative Marriage</th>
<th>Income Assortative Marriage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypogamy</td>
<td>Homogamy</td>
<td>Hypergamy</td>
</tr>
<tr>
<td>1980</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypogamy</td>
<td>18.02</td>
<td>12.50</td>
<td>69.48</td>
</tr>
<tr>
<td>Homogamy</td>
<td>13.56</td>
<td>12.14</td>
<td>74.30</td>
</tr>
<tr>
<td>Hypergamy</td>
<td>15.97</td>
<td>10.83</td>
<td>73.21</td>
</tr>
<tr>
<td>Total</td>
<td>14.80</td>
<td>11.92</td>
<td>73.28</td>
</tr>
<tr>
<td>2008–2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypogamy</td>
<td>31.68</td>
<td>17.65</td>
<td>50.66</td>
</tr>
<tr>
<td>Homogamy</td>
<td>21.37</td>
<td>18.65</td>
<td>59.97</td>
</tr>
<tr>
<td>Hypergamy</td>
<td>16.51</td>
<td>14.39</td>
<td>69.10</td>
</tr>
<tr>
<td>Total</td>
<td>23.83</td>
<td>17.63</td>
<td>58.54</td>
</tr>
</tbody>
</table>

_Note_: Hypogamy is marriage where the wife is more educated or in a higher income decile than the husband. Homogamy is marriage where two spouses share the same level of education or income. Hypergamy is marriage where the husband is more educated or in a higher income decile than the wife. Numbers in bold are row percentages, indicating percentages of income assortative marriages by the educational pairing of spouses. Data were weighted in 2008–2012.
These patterns and trends in Table 1 should be interpreted with caution, however, because they may be highly influenced by the educational and income distributions of husbands and wives as well as changes in these distributions (Gullickson & Fu, 2010; Hou & Myles, 2008; Hout, 1983; Kalmijn, 2010; Schwartz & Mare, 2005). For example, the percentage of couples in which the wife has more education or income than the husband may have increased between 1980 and 2008–2012 because of the disproportionate increase in education and income for women. Relatedly, as income goes up with education for both sexes, women will often be less likely to marry a husband with higher income than themselves when they marry down in education compared with when they marry up in education. Thus, gender inequalities in education and income, income differentials across educational and gender groups, and changes in these distributions determine the marital “opportunity structure” for men and women in the marriage markets (Hou & Myles, 2008). Log-linear models allow me to examine whether the gender asymmetry in educational and income assortative mating held and whether there were changes in the asymmetry after controlling for the compositional effects such as gender differences and shifts in the marginal distributions of education and income.

Results of Log-Linear Models

Table 2 provides the model specifications and the goodness-of-fit statistics. I present both the deviance and the Bayesian information criterion (BIC) statistics for model fit, but mainly focus on the BIC due to the large sample size (Gullickson & Torche, 2014). A smaller value of the BIC indicates a better-fitting model (Raftery, 1986). Model 1, the baseline model, is described by Equation 1. This model assumes no
association between husband’s and wife’s characteristics. Not surprisingly, the BIC for Model 1 is much larger than zero, indicating a poor model fit.

I examined educational assortative mating patterns by fitting Models 2 through 5. To capture the tendency for individuals to marry within their educational groups, I added four parameters along the main educational diagonal in Model 2. The great reduction in the BIC statistic indicates a strong tendency for individuals to marry similarly-educated spouses. In Model 3, adding a uniform educational hypogamy parameter decreased the BIC relative to Model 2, indicating the gender asymmetric nature of educational assortative mating patterns. Model 4 captures changes in the tendency for couples to marry within the same educational category. By the BIC, adding these terms improved the fit of the model relative to Model 3, indicating that educational homogamy changed significantly between 1980 and 2008–2012. To model changes in the tendency for women to marry down in education, I added an interaction term between year and the educational hypogamy parameter in Model 5, which decreased the BIC. It suggests that the tendency for women to marry less-educated husbands changed from 1980 to 2008–2012 even net of shifts in the marginal distributions of spouses’ education.
Table 2. Fit Statistics for Log-Linear Models

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>Deviance</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3,042</td>
<td>49,072.61</td>
<td>14,897.07</td>
</tr>
<tr>
<td>2</td>
<td>3,038</td>
<td>23,013.98</td>
<td>-11,116.61</td>
</tr>
<tr>
<td>3</td>
<td>3,037</td>
<td>22,877.31</td>
<td>-11,242.04</td>
</tr>
<tr>
<td>4</td>
<td>3,033</td>
<td>22,566.94</td>
<td>-11,507.48</td>
</tr>
<tr>
<td>5</td>
<td>3,032</td>
<td>21,890.54</td>
<td>-12,172.65</td>
</tr>
<tr>
<td>6</td>
<td>3,023</td>
<td>13,709.65</td>
<td>-20,252.42</td>
</tr>
<tr>
<td>7</td>
<td>3,022</td>
<td>13,357.77</td>
<td>-20,593.07</td>
</tr>
<tr>
<td>8</td>
<td>3,013</td>
<td>13,145.43</td>
<td>-20,704.30</td>
</tr>
<tr>
<td>9</td>
<td>3,012</td>
<td>13,104.33</td>
<td>-20,734.17</td>
</tr>
<tr>
<td>10</td>
<td>2,962</td>
<td>12,098.02</td>
<td>-21,178.74</td>
</tr>
<tr>
<td>11</td>
<td>2,912</td>
<td>11,929.03</td>
<td>-20,786.01</td>
</tr>
</tbody>
</table>

Note: \( N = 38,016 + 37,686 = 75,702; \) cells = 3,200. \( df = \) degrees of freedom.

Model terms are as follows (\( df s \) are in parentheses): \( HE = \) husbands’ education (3); \( WE = \) wives’ education (3); \( HP = \) husbands’ income decile (9); \( WP = \) wives’ income decile (9); \( Y = \) year (1); \( EO = \) variable diagonal parameters indicating educational homogamy (4); \( EHypo = \) educational hypogamy parameter (1); \( |HP - WP| = \) absolute value of difference between husbands’ income decile and wives’ income decile (9); \( IHyper = \) income hypergamy parameter (1).
Next, in Models 6 through 9, I investigated patterns of income assortative marriage. In Model 6, I added nine dummy variables indicating the absolute value of the differences between husband’s and wife’s income deciles. By the BIC, the distance parameters improved the model fit. To examine gender asymmetry in income assortative mating, I added a uniform income hypergamy parameter to Model 6. Compared with Model 6, there was a reduction in the BIC in Model 7. Thus, the association between spouses’ income remains gender asymmetrical even after controlling for gender differentials in the marginal distributions of income. Model 8 and Model 9 indicate significant changes in the likelihood of marriages that cross income boundaries and the likelihood of income hypergamy from 1980 to 2008–2012, according to the BIC.

Building on the best-fitting Model 9, I added the interaction terms between the income distance and hypergamy parameters and the educational homogamy and hypogamy parameters in Model 10 to investigate how income and education interact to shape the patterns of who marries whom. By the BIC, Model 10 provided a better fit to the data than Model 9, suggesting that income assortative mating patterns differ by the educational pairing of spouses. I examined changes in the interaction between income and educational assortative mating in Model 11. The BIC of Model 11 was greater (i.e., less negative) than that of Model 10. Therefore, Model 11 did not fit more closely to the data than Model 10, suggesting that the associations between income and education assortative mating did not change from 1980 to 2008–2012.

Next, in Table 3, I present the key parameter estimates of Model 9 that reveal the patterns of and changes in educational and income assortative mating and the key
parameter estimates of Model 10 that indicate how income and education interact to shape gender asymmetry in assortative mating. Model 9 first presents parameter estimates for educational assortative mating. Between 1980 and 2008–2012, educational homogamy in which two spouses share the same education level increased significantly for couples with high school education or less ($\beta = 0.22, p < 0.001$), for couples with some college education ($\beta = 1.34, p < 0.001$), and for couples with college degrees ($\beta = 0.45, p < 0.001$), but did not change significantly for couples with advanced degrees ($\beta = 0.10, p > 0.05$), after controlling for shifts in the marginal distributions of spouses’ education. Additionally, educational hypogamy increased over the time period net of shifts in the marginal distributions ($\beta = 1.55, p < 0.001$). In 1980, educational hypogamy in which the wife is more educated than the husband were 43 percent less likely to occur than educational hypergamy in which the wife is less educated than the husband ($\beta = -0.57, \exp(\beta) = 0.57, p < 0.001$), whereas in 2008–2012, educational hypogamy was 166 percent more likely to occur than educational hypergamy ($\beta = -0.57 + 1.55 = 0.98, \exp(\beta) = 2.66, p < 0.001$). The log-linear results align with the descriptive results and further indicate that the increase in educational hypogamy in which the wife is more educated than the husband was not due to the rising female advantage in educational attainment alone. The findings support Hypothesis 1: Educational hypogamy in which the wife has more education than the husband increased between 1980 and 2008–2012.

Model 9 also reveals patterns of income assortative marriage. The significant, negative coefficients for the absolute values of differences between husbands’ and wives’ income deciles indicate a tendency for individuals to marry a spouse within the same
income decile in 1980 (e.g., $\beta_{|H_p - W_p| = 1} = -0.50, p < 0.001$; … $\beta_{|H_p - W_p| = 9} = -1.30, p < 0.001$). Moreover, with few exceptions, the larger the distance between husband’s and wife’s income deciles, the lower the likelihood of marriage. The interaction terms between distance parameters and year are mostly negative and statistically significant, indicating that in general, marriages between spouses from different income deciles were less likely to occur in 2008–2012 than in 1980. Consistent with Hypothesis 2, income hypergamy in which the wife has lower income than the husband declined between 1980 and 2008–2012 ($\beta = -0.23, p < 0.001$), net of shifts in the marginal distributions of husband’s and wife’s income deciles. Despite a significant decline, the coefficients for income hypergamy were significantly positive in both time periods (1980: $\beta = 0.48, p < 0.001$; 2008–2012: $\beta = 0.48 + (-0.23) = 0.25, p < 0.001$). This result indicates that if marrying across income deciles, women tended to marry up more than marry down in income in both time periods even after controlling for gender differences in the marginal distributions of income deciles.

The interaction terms between the income hypergamy parameter and the educational assortative mating parameters in Model 10 reveal variation in the tendency for women to marry up in income by the educational pairing of spouses. The tendency for women to marry up in income was greater when they married down in education: women were 68 percent more likely to marry men in higher income deciles than themselves among couples in which the wife has more education than the husband than among couples in which the wife has less education than the husband ($\beta = 0.52, \exp(\beta) = 1.68, p < 0.001$). For the most part, the tendency for women to marry up in income was greater
among couples who share the same education level: compared with couples in which the
wife has less education than the husband, the tendency for women to marry up in income
was 49 percent higher among couples in which both spouses have high school education
or less (β = 0.40, exp(β) = 1.49, p < 0.001), and 28 percent higher among couples in
which both spouses have some college education or both have college education (for both
types of couples: β = 0.25, exp(β) = 1.28, p < 0.001). But the tendency for women to
marry up in income did not differ significantly between couples in which both spouses
have advanced degrees and couples in which the wife has less education than the husband
(β = -0.07, p > 0.05). Clearly, among couples who share the same education level, the
tendency for women to marry up in income was more pronounced at the lower end of the
education distribution.
Table 3. Select Parameter Estimates from Models 9 and 10

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Model 9</th>
<th></th>
<th>Model 10</th>
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<tbody>
<tr>
<td></td>
<td>β</td>
<td>Std. Err.</td>
<td>β</td>
<td>Std. Err.</td>
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<tr>
<td><strong>Educational homogamy</strong></td>
<td></td>
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<tr>
<td>Both spouses with high school education or less</td>
<td>1.95 ***</td>
<td>0.039</td>
<td>1.70 ***</td>
<td>0.050</td>
</tr>
<tr>
<td>Both spouses with some college education</td>
<td>-0.45 ***</td>
<td>0.038</td>
<td>-0.45 ***</td>
<td>0.050</td>
</tr>
<tr>
<td>Both spouses with college degrees</td>
<td>1.15 ***</td>
<td>0.043</td>
<td>1.16 ***</td>
<td>0.055</td>
</tr>
<tr>
<td>Both spouses with advanced degrees</td>
<td>1.96 ***</td>
<td>0.060</td>
<td>1.97 ***</td>
<td>0.076</td>
</tr>
<tr>
<td><strong>Educational hypogamy</strong></td>
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<tr>
<td>-0.57 *** 0.050</td>
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<td></td>
<td>-0.81 *** 0.058</td>
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<tr>
<td><strong>Changes in educational homogamy</strong></td>
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</tr>
<tr>
<td>Both spouses with high school education or less × Year (2008–2012)</td>
<td>0.22 *** 0.053</td>
<td></td>
<td>0.25 *** 0.053</td>
<td></td>
</tr>
<tr>
<td>Both spouses with some college education × Year (2008–2012)</td>
<td>1.34 *** 0.052</td>
<td></td>
<td>1.33 *** 0.052</td>
<td></td>
</tr>
<tr>
<td>Both spouses with college degrees × Year (2008–2012)</td>
<td>0.45 *** 0.055</td>
<td></td>
<td>0.46 *** 0.055</td>
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<tr>
<td>Both spouses with advanced degrees × Year (2008–2012)</td>
<td>0.10 0.075</td>
<td></td>
<td>0.09 0.076</td>
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<td><strong>Changes in educational hypogamy</strong></td>
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<tr>
<td>Educational hypogamy × Year (2008–2012)</td>
<td>1.55 *** 0.064</td>
<td></td>
<td>1.61 *** 0.064</td>
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Table 3 continued

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Model 9</th>
<th>Model 10</th>
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<tbody>
<tr>
<td></td>
<td>( \beta )</td>
<td>Std. Err.</td>
</tr>
<tr>
<td>(</td>
<td>H_p - W_p</td>
<td>= 7)</td>
</tr>
<tr>
<td>(</td>
<td>H_p - W_p</td>
<td>= 8)</td>
</tr>
<tr>
<td>(</td>
<td>H_p - W_p</td>
<td>= 9)</td>
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<tr>
<td>Changes in (</td>
<td>H_p - W_p</td>
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<tr>
<td></td>
<td>(</td>
<td>H_p - W_p</td>
</tr>
<tr>
<td>Income hypergamy</td>
<td>0.48 ***</td>
<td>0.028</td>
</tr>
<tr>
<td>Changes in income hypergamy</td>
<td>Income Hypergamy \times Year (2008–2012)</td>
<td>-0.23 ***</td>
</tr>
</tbody>
</table>

Continued
### Table 3 continued

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Model 9</th>
<th>Model 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>Std. Err.</td>
</tr>
<tr>
<td><strong>Interaction between educational and income assortative mating</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both spouses with high school education or less $\times$ Income hypergamy</td>
<td>0.40***</td>
<td>0.036</td>
</tr>
<tr>
<td>Both spouses with some college education $\times$ Income hypergamy</td>
<td>0.25***</td>
<td>0.037</td>
</tr>
<tr>
<td>Both spouses with college degrees $\times$ Income hypergamy</td>
<td>0.25***</td>
<td>0.041</td>
</tr>
<tr>
<td>Both spouses with advanced degrees $\times$ Income hypergamy</td>
<td>-0.07</td>
<td>0.064</td>
</tr>
<tr>
<td>Educational hypogamy $\times$ Income hypergamy</td>
<td>0.52***</td>
<td>0.033</td>
</tr>
</tbody>
</table>

*Note:* Std. Err. = Standard Errors. $|H_p - W_p|$ = absolute value of difference between husbands’ and wives’ income deciles. To save space, I only present coefficients for the variables of main interest, but full models are available upon request.

**p < 0.001; **p < 0.01; *p < 0.05** (two-tailed tests).
It is worth noting that the results from log-linear analyses differ from the raw percentages in Table 1 where the percentage of income hypergamy in which women marry up in income was lower among couples in which the wife has more education than the husband than among those in which the wife has less education than the husband (69.48% versus 73.21% in 1980; 50.66% versus 69.10% in 2008–2012). The main reason why log-linear models and descriptive analyses yielded different results lies in the way they treat income differentials between men and women and between the less-educated and the more-educated. On average, men have higher income than women and income increases with education for both sexes. Thus, even if the tendency for income hypergamy is the same across educational pairings of spouses, given the marginal distributions of income by gender and education, women are expected to marry up in income less often when they marry down in education compared with when they marry up in education. Relatedly, even given constant associations between spouses’ education and income, the share of income hypergamy may have decreased especially among couples in which the wife has more education than the husband because of the relative stagnation or decline in income among less-educated men and the disproportionate increase in income for women relative to men. Thus, in contrast to simple descriptive analyses that do not tease out the compositional effects, log-linear models reveal whether asymmetric mating tendencies exist and whether they have changed net of gender differences and shifts in marginal distributions of education and income.

Overall, the results from Model 10 support Hypotheses 3a and 4a that the tendency for women to marry up in income was greater among couples in which the wife
has an education level surpassing or equal to that of the husband. The tendency for women to marry a higher-income husband than themselves was most pronounced among couples in which the wife has more education than the husband. Additionally, among couples who share the same education level, the tendency for women to marry up in income was greater among the less-educated couples than among the highly-educated couples. Furthermore, consistent with Hypotheses 3b and 4b, variation in the degree of gender asymmetry in income assortative mating by the educational pairing of spouses did not really change from 1980 to 2008–2012 because the BIC did not decrease further from Model 10 to Model 11 when I added interaction terms with year. Hence, the results from Model 10 indicate that women married to men whose education levels are equal to or lower than their own did not necessarily challenge the higher status of men in marriage, because women in these marriages instead married up in terms of income.

Summary and Discussion

This study tackles the important and timely issue of the rising female advantage in educational attainment and its consequences in the realm of marriage and family. The findings of this study reveal both changes and continuities in assortative mating. The share of previously non-normative marriages in which the wife has more education than the husband (educational hypogamy) doubled between 1980 and 2008–2012. Results from log-linear models confirm that even net of women’s disproportionate increases in educational attainment, educational hypogamy increased significantly and gender asymmetry in educational assortative mating reversed from a tendency for women to marry up to a tendency for women to marry down in terms of education. Does increased
educational hypogamy indicate a shift away from the convention of mate selection that embodies male dominance? If we examine income assortative mating, the answer is no. In both time periods, husbands were more likely to be in higher income deciles than their wives than the reverse pattern. After controlling for gender differences and shifts in the marginal distributions of income deciles, the tendency for women to marry up in income remained evident, although the tendency declined over the period.

More importantly, when considering how education and income jointly shape assortative mating patterns, I found that men and women tended to avoid status reversal in the mate selection process. Log-linear analyses showed that the tendency for women to marry up in income was greater among couples in which the wife’s education level equals or exceeds that of the husband than among couples in which the wife has less education than the husband. I did not find a more pronounced tendency for women to marry up in income among couples in which both spouses have advanced degrees. Moreover, the variation in the tendency for women to marry up in income across educational pairings of spouses did not change between 1980 and 2008–2012. Thus, the status characteristics of marriages in which the wife’s education level equals or exceeds that of the husband remained traditional in recent decades in the sense that such marriages still occurred primarily when women instead married up in income.

This study provides an empirical assessment regarding gender change in heterosexual marriages. The “uneven and stalled gender revolution” perspective (England, 2010) posits that progress toward gender equality in heterosexual relationships has been more limited than in the economic realms and that even the progress in paid
work has stalled since the 1990s. This study finds both counterpoints and supportive evidence for this perspective. On the one hand, the gender revolution does not appear to be uneven because assortative mating patterns resonates with changes in gender inequality in education and income. Between 1980 and 2008–2012, accompanied by the reversal of the gender gap in education from a male advantage to a female advantage, gender asymmetry in educational assortative mating changed from a tendency for men to marry down in education to a tendency for women to marry down in education. The gender pay gap that favors men declined in recent decades, but was not eliminated (Blau & Kahn, 2007). Correspondingly, the tendency for women to marry up in income weakened but persisted between 1980 and 2008–2012. The log-linear results suggest that the patterns of and the changes in gender asymmetry in assortative mating cannot be attributed to gender differences and shifts in the marginal distributions of education and income alone. Structural factors such as gender inequalities in education and income influence the availability of spouses in the marriage market. In all likelihood, they also influence individuals’ attitudes about what is a “normative” or “acceptable” match. Thus, changes in gender inequality in education and paid work spill over into personal relationships (Graf & Schwartz, 2011) and impact who marries whom.

On the other hand, there seems to be a stall in the gender revolution in heterosexual marriages: I found little change in the conventional male status dominance in marriage when examining how education and income interact to shape who marries whom. In both 1980 and 2008–2012, there was a greater tendency for women to marry up in income among couples in which the wife’s education level equals or surpasses that of
the husband, suggesting that these couples tended to avoid status reversal in marriage through income assortative mating. The finding suggests that the traditional male status dominance and male-breadwinner norm in American marriages changed little in recent decades. With increases in their economic independence implied by their high levels of education, women do not necessarily lower the value attached to financial resources of potential spouses. The growing income inequality in recent decades in the United States likely increases the costs of women marrying down economically (Fernández, Guner, & Knowles, 2005). Thus, given a shortage of more-educated men but the continued availability of higher-earning men, women may seek to maximize gains from marriage by evaluating potential spouses more on the basis of income. Because mate selection is a two-sided process, it is equally possible that men hesitate to form marital relationships with women who have both more education and higher incomes than they do. This study found a lack of change in the convention of mate selection that embodies male dominance, and suggests a “stalled gender revolution” (England, 2010) because men and women continue to form marriages in which the wife’s socioeconomic status does not exceed that of the husband.

This study also points to the importance of income in assortative mating. As individuals marry at later ages, and often after they have established their economic roles (Cherlin, 2004; 2010), they may increasingly use income, as opposed to education level, as the main marker of a potential spouse’s economic prospects. As long as gender pay gaps continue to favor men, the role of the remarkable advances in women’s educational
attainment in redefining gender role expectations in American families may be more limited than assumed.

This study is subject to several limitations. Because the 1990 and 2000 U.S. Censuses did not collect information on marital timing, I was not able to examine educational and income assortative mating for newlyweds in these time periods. Future work using appropriate data collected during the 1990s and 2000s will provide a more thorough description of trends over time. Following prior assortative mating research (e.g., Mare, 1991; Qian & Lichter, 2007; 2011; Schwartz & Mare, 2005), I treated the United States as a national marriage market. Future work could examine how gendered distributions of education and income in local marriage markets affect partner choice. This study examined only individuals who got married, similar to prior assortative mating research (e.g., Mare, 1991; Schwartz & Mare, 2005). Future work could incorporate unmarried individuals who are at the risk of marriage into the analysis to gain a more complete understanding of mate selection processes. In addition, it is beyond the scope of this study to investigate why there was no greater tendency for women to marry up in income among couples in which both spouses have advanced degrees. More research should separate this group of people from college graduates and investigate how they make decisions about partner choice.

One area that has shown no signs of stalled progress toward gender equality is women’s increasing educational advantage over men (Cotter et al., 2011). The reversal of the gender gap in educational attainment could potentially have implications for marriage formation and couple relations. Wives with more education than their husbands are no
longer more likely to divorce than other women (Schwartz & Han, 2014). This study finds that women married to men whose education levels are equal to or lower than their own do not necessarily challenge the traditional, male-dominant status in marriage since these marriages primarily occur when women instead marry up in terms of income. Thus, future research should investigate whether other compensatory behaviors occur in marriages where wives have more education than their husbands and how multiple dimensions of spousal traits have consequences for family lives.
Chapter 3: Educational Assortative Mating and Income Trajectories of Husbands and Wives

Over the past few decades, labor force participation increased dramatically among American women (England, 2010). In addition, women increasingly entered male-dominated jobs and occupational gender segregation declined substantially (Blau et al., 2013; England, 2010; Hegewisch, 2010). Meanwhile, the gender pay gap narrowed considerably (Blau & Kahn, 2000). Moreover, the gender gap in educational attainment reversed from a male advantage to a female advantage—more women than men now enrolling in and completing college (DiPrete & Buchmann, 2013). In light of these changes in education and employment, women increasingly marry husbands whose educational levels equal or lag behind their own (Schwartz & Mare, 2005) and the majority of married couples are now dual-earner couples (Raley et al., 2006). In addition, research that used repeated cross-sectional data finds that the positive association between spouses’ incomes and the share of couples in which wives are primary earners have increased over the past several decades (Cancian & Reed, 1999; Raley et al., 2006; Schwartz, 2010).

Yet, our understanding of how and to what extent husbands’ and wives’ incomes change over the marital life course is still far from complete. Prior research took snapshots of married couples at different time points and examined trends in the
association between spouses’ incomes or wives’ share of household income (Raley et al., 2006; Schwartz, 2010), but few studies, if any, have tracked changes in income within married couples over an extended period of time. Examining income dynamics in couples is crucial to a full understanding of economic gender inequality within families. Bargaining theory of marriage argues that the resources one partner brings to the family affect the marital power one can exert in the family (England, 2003). The smaller amount of money women bring into the household relative to their husbands has long been identified as a factor that contributes to women’s subordinated status and lower bargaining power in the family (England, 2003; Hartmann, 1976). Thus, tracking income dynamics in couples helps better understand how the bargaining power in heterosexual marriages might change over the course of marriage.

The current study contributes to the gender stratification literature by examining the relative economic positions that husbands and wives occupy at the onset of marriage formation and investigating how husbands’ and wives’ incomes evolve in the “gender factory” of the married-couple family (Berk, 1985). Furthermore, the current study focuses on how educational assortative mating, that is, the educational pairing of spouses at the time of marriage, shapes the long-term patterns of husbands’ and wives’ income trajectories. Thus, this study sheds light on the implications of women’s rise in education for gender economic inequality within couples over the marital life course.

Existing studies that have examined the gender income gap within couples suggest the importance of employing a longitudinal approach to understanding the dynamic nature of spouses’ income trajectories. Winkler and colleagues (2005) and
Winslow-Bowe (2006) have examined the persistence of spouses’ earnings patterns, in particular the persistence of the nontraditional arrangement where wives outearn their husbands. Both studies have identified a set of sociodemographic and life course characteristics that are associated with wives’ single-year and consistent income advantages. These studies reveal substantial fluctuation in wives’ income advantage within marriage and find that even among wives who outearn their husbands, their earnings advantage is hardly persistent (Winkler et al., 2005; Winslow-Bowe, 2006). For example, while about 10 percent of wives earned 60 percent or more of couple’s total income at a given year, less than half of them did so for 3 consecutive years, and only a quarter of them did so over a 5-year period (Winkler et al., 2005; Winslow-Bowe, 2006).

These studies are limited in two major ways. First, the analyses were restricted to a limited time window. Winkler and colleagues (2005) used the 1996–2000 Surveys of Income and Program Participation (SIPP) to investigate the persistence of spouses’ earnings patterns for a three-year period. Similarly, Winslow-Bowe (2006) analyzed the 1990–1994 waves of the National Longitudinal Survey of Youth 1979 to examine wives’ earnings advantage over a five-year period. As individuals’ work and family experiences change over the life course (Garcia-Manglano 2015; Umberson et al., 2010), it is worth further investigating how the dynamics of couples’ income patterns evolve over a longer time frame. Relatedly, both studies (Winkler et al., 2005; Winslow-Bowe, 2006) pooled couples at various durations of marriage. Thus, it is less clear how couples start off and how incomes of both spouses evolve from the year of marriage over the twenty years following marriage formation.
Second, while Winkler and colleagues (2005) and Winslow-Bowe (2006) focused on examining husbands’ and wives’ relative income, the question remains as to how the within-couple gender differences in income trajectories contribute to a decline in wives’ share of couples’ total income. It is possible that both husbands’ and wives’ income increases after marriage, but husbands’ income grows at a faster rate. Consequently, a decline in wives’ relative income is largely due to husbands’ faster rate of income growth. Alternatively, husbands and wives income trajectories may diverge after marriage, with increases in husbands’ income but decreases in wives’ income, which leads to a reduction in wives’ economic contribution to the family. Indeed, prior research examined gender-specific income trajectories after marriage, but change in income with marital duration was often analyzed separately by gender based on nonpartnered data (e.g., Cheng, 2016; Cooke et al., 2009; Dougherty, 2006; Light, 2004). This line of research neglects the interdependence of couple members’ behavior and experiences, including shared characteristics and life events, associations between spouses’ income, and the effects of spouses on one another’s labor supply and income, to name a few.

To sum up, the current study uses a nationally representative sample from the National Longitudinal Survey of Youth 1979 (NLSY79) and longitudinal multilevel dyad models (Lyons & Sayer, 2005) to investigate changes in husbands’ and wives’ incomes over the marital life course. The application of multilevel models to longitudinal dyadic data allows me to take couples’ interdependence into account, investigate cross-partner effects on income change, and assess heterogeneity in change across couples. The goal of this study is to address three research questions:
1). Are there significant differences between the average income trajectories for husbands and wives?

2). How do husbands’ and wives’ income trajectories vary by educational pairings of spouses?

3). What factors account for variation in husbands’ and wives’ income trajectories by educational pairings of spouses?

Theoretical Frameworks

I draw on the life course perspective and the new home economics as theoretical frameworks to understand relationships between educational assortative mating and income dynamics in couples. As longitudinal data become increasingly available, family scholars have called for applications of the life course perspectives to studying families over time (Bengtson & Allen, 2009). The life course perspective draws attentions to continuity and change in individuals’ employment and family experiences over the life course and recognizes the heterogeneity in marital relationships, life course experiences, and income trajectories (Elder, 1975). In addition, one of the central principles of the life course perspective is that of linked lives, which implies that mutual influences are constantly at work so that one’s life trajectory is influenced by significant others (Elder, 1998; Elder, Johnson, & Crosnoe, 2003). Therefore, this theoretical perspective suggests that circumstances in a partner’s life, such as employment and income, would have implications for the life of the other partner. The principle of linked lives is particularly relevant to married couples. First, married couples look alike along a variety of sociodemographic attributes, such as race and educational attainment (for reviews, see
Kalmijn, 1998; Schwartz, 2013). Also, married couples share a lot of life events and experiences, such as transition to parenthood after marriage, raising children together, and so on. Finally, income and labor supply of one spouse are correlated with those of the other (Cha, 2010; Schwartz, 2010). Therefore, the income trajectories of spouses are very likely to be related.

Guided by the life course perspective, this study empirically models the dynamic trajectories of husbands’ and wives’ incomes over the course of marriage. The principle of linked lives in the life course perspective highlights the possibility that husbands’ and wives’ incomes evolve over the course of marriage depends on not only their own educational levels but also their education relative to that of their spouses. Thus, recognizing the heterogeneity in income trajectories and the “linked lives” of husbands and wives, this study examines how educational pairings of spouses at marriage, that is, educational assortative mating, play a role in shaping long-term changes in husbands’ and wives’ incomes. Moreover, the principle of linked lives also implies that the husband’s income trajectory may not be independent from that of the wife. Thus, using well-suited statistical models, this study not only takes into account but also explicitly quantify the correlation between husbands’ and wives’ initial incomes at marriage as well as the correlation between spouses’ rates of change in income.

Why might educational pairings of spouses shape income dynamics in couples? The new home economics argues that sexual division of labor within families, with each spouse specializing in the sector he or she has comparative advantage in, maximizes the household utility (Becker, 1981). Historically, husband tended to have more education
and invest more in human capital than wives. Thus, husbands usually occupied the
breadwinning role in the family, whereas women, contrastingly but complementarily,
specialized in the private sphere, rearing children and taking care of the home. Therefore,
if income patterns are partly a result of intrahousehold specialization, individuals’ own
educational attainment and their education relative to that of their spouses likely shape
long-term dynamics of couples’ earnings patterns.

Previous Research and Hypotheses

Despite increased education and employment among women, by 2001, about two
thirds of married couples were traditional couples in which husband contributed 60
percent or more of the couple’s income (Raley et al., 2006). At the end of the twentieth
century, working wives, on average, produced less than one-third of total family income
(Nock, 2001). In addition to the within-couple income gap observed at one point in time,
over the family life course, married couples usually make family decisions (e.g.,
migration, time allocation, etc.) that prioritize husbands’ careers (Becker & Moen, 1999).
For example, women usually reduce their employment hours after childbirth, which
largely contributes to the reduction in wives’ earnings relative to their husbands in
households with young children (Winslow-Bowe, 2006; 2009). Additionally, similar to
childbirth, migration also leads to a widening intrafamily gender earnings gap (Cooke et
al., 2009). Given that gendered career prioritization evolves over time, marital duration is
found to be negatively associated with the odds of wives’ persistent income advantage
(Winslow-Bowe, 2006).
Couples’ decisions and earnings patterns within marriage may be influenced by labor market constraints. Research consistently reveals a “marriage premium” for men’s wages, although it is still under lively debate whether this is attributed to selectivity into marriage, within-household specialization, increased productivities, or cultural beliefs of breadwinners attached to married men’s marital role (e.g., Cheng, 2016; Chun & Lee, 2001; Cohen, 2002; Cornwell & Rupert, 1997; Dougherty, 2006; Killewald & Gough, 2013; Light, 2004; Orloff, 1996). By contrast, findings regarding the effect of marriage on female earnings are mixed (see Dougherty, 2006 for a review; also see Cheng, 2016; Killewald & Gough, 2013). While the marriage premium for women is limited (if any), evidence of the motherhood penalty is clear (Correll, Benard, & Paik, 2007). After controlling for a series of factors, employed mothers in the United States, on average, suffer a per-child wage penalty of approximately 5 percent (Anderson, Binder, & Krause, 2003; Budig & England, 2001). Fathers, however, experience a fatherhood premium (Glauber, 2008; Hersch & Stratton, 2000; Hodges and Budig, 2010; Lundberg and Rose, 2000; 2002), in particular for married residential fathers (Killewald, 2013). Therefore, it is likely that wives suffer a wage penalty whereas husbands experience a wage premium, especially if they are parents of minor children.

In sum, the dynamics of couples’ income patterns result from a complex interplay of couples’ family and career decisions within families and labor market constraints outside families. In this study, I make no attempt to disentangle the effects of family processes and labor market forces. Rather, I take an important initial step to examine the net effects of those mechanisms on income dynamics in couples. Given family decisions
that tend to prioritize husbands’ careers and labor market rewards attached to married men and fatherhood, I develop my first sets of hypotheses that 1) on average, the husband’s income increases over the marital life course; and 2) the wife’s income decreases at least in the early years of marriage.

However, according to the heterogeneity in life experiences and trajectories emphasized by the life course perspective, husbands’ and wives’ income trajectories are likely to vary across couples. The new home economics models predict efficient household division of labor based on comparative advantage of each spouse (Becker, 1981). Thus, the more husband and wife resemble each other with respect to education and earnings potential at the time of marriage, the more slowly the wife’s income lags behind that of the husband after marriage. Empirical evidence shows that human capital does play a role in shaping couples’ earnings patterns. Women’s education encourages their employment (England, Garcia-Beaulieu, & Ross, 2004). If the wife has invested in human capital more than the husband, such as in marriage where the wife has more education than the husband, women are more likely to earn more than their husbands in a single year and for several consecutive years (Raley et al., 2006; Winkler et al., 2005; Winslow-Bowe, 2006). Wives’ short-term and long-term income advantage is also evident among couples in which both spouses are highly educated (Winslow-Bowe, 2006). Taken together, I hypothesize that 3) the husband’s and wife’s income trajectories depend on their own education and their education relative to the spouse, and in particular, the decrease in the wife’s income with marital duration is less pronounced
when the wife has more education than the husband, compared with other types of educational pairings of spouses.

Method

Data

I use data from the National Longitudinal Survey of Youth 1979 (NLSY79) to examine how husbands’ and wives’ incomes jointly evolve over the marital life course. The NLSY79 is a nationally representative sample of 12,686 young men and women who were 14–22 years old when they were first surveyed in 1979. The survey was conducted annually through 1994 and is currently carried out on a biennial basis. When the cohort was first surveyed, many of them just began to transition from school to work and to form heterosexual unions. At the time of their 2012 interviews, when the most recent data are currently available, the respondents were 47–56 years of age and approaching the end of their prime working-age years (Bureau of Labor Statistics, 2016). Because close to 90 percent of the respondents (11,117 out of 12,686) were never married at the time of the first interview, a particular advantage of the NLSY79 is that the vast majority of the respondents can be tracked from the beginning of their first marriages. In sum, the NLSY79 provides a unique opportunity to study income dynamics in couples among the late baby boomer cohort born between 1957 and 1964 over almost the entire marital life course during which both partners were of active working age.

There are several advantages of the NLSY79 over other longitudinal datasets such as the Panel Study of Income Dynamics (PSID) and the Survey of Income and Program Participation (SIPP). First, the NLSY79 covers a long period of time spanning over three
decades, whereas the duration of each SIPP panel is much shorter and only ranges from 2.5 years to 4 years. Second, the PSID and SIPP survey nationally representative samples of U.S. families and interview all household members age 15 years and older (SIPP; The U.S. Census Bureau, 2016) or all persons regardless of age living in the PSID families (PSID Main Interview User Manual, 2015). Patterns of income and educational assortative mating, gender inequalities in educational attainment, and individuals’ (in particular women’s) employment patterns along the life course differ considerably across birth cohorts, which likely leads to cohort variations in couples’ income dynamics (see Chapter 2 of this dissertation; DiPrete & Buchmann, 2013; Percheski, 2008; Raley et al., 2006; Sweeney & Cancian, 2004; Winkler et al., 2005). The data from the PSID or SIPP will not allow me to capture the earlier years of marriage in older birth cohorts or to observe the couples in younger birth cohorts for an extended period of time. In addition, the more recent cohorts in the PSID or SIPP samples are likely a selective group who married at relatively young ages. In contrast, analyses that focus on one birth cohort could better illustrate changes over the marital life course while minimize variation arising from the cohort effects. Moreover, the NLSY79 allows me to examine a large sample of the late baby boomer cohort who received education, entered the labor force, and formed marriages during the period when the most rapid changes in women’s economic and family roles occurred (Goldin, 2004). Finally, prior research has used the NLSY79 to examine wives’ income advantage over a limited period of time (i.e., five years; Winslow-Bowe, 2006). Thus, by examining husbands’ and wives’ income
dynamics in the NLSY79 sample, the current study not only provides some comparability with prior research but also extends the existing literature.

Sample

I restrict my analysis to the cross-sectional sample \((N = 6,111)\) and the supplementary sample of Hispanics and blacks \((N = 3,652)\), which consist of 9,763 respondents. Note that the cross-sectional sample of 6,111 respondents was designed to represent the noninstitutionalized civilian segment of people ages 14 to 22 and living in the United States in 1979. Respondents in the cross-sectional sample and the supplementary sample of Hispanics and blacks have been eligible for interview during each round of the NLSY79. I drop the military sample \((N = 1,280)\) and the supplementary sample of economically disadvantaged, nonblack/non-Hispanic respondents \((N = 1,643)\) because these subsamples have not been followed throughout the entire survey period.

Among the 9,763 respondents, I drop 1,885 individuals who have never been married since they were first interviewed. I further drop 215 individuals with missing data on year of their first marriage because the entry into first marriage of these respondents and the duration of their marriage cannot be accurately determined. The 7,663 individuals left in the analytic sample have a total of 173,148 person years. I restrict the sample to 72,461 person years for which the NLSY79 respondents were in their first marriages with spouse present. Second and higher-order marriages are more selective than first marriages because first marriages do not necessarily dissolve and individuals, particularly women, do not necessarily remarry after marital dissolution (Shafer & James, 2013). The income dynamics in couples may vary by marriage order,
but the small number of higher order marriages makes it difficult to produce robust results given that modeling multiple marriages requires three-level hierarchical models.

I need to identify respondents’ and spouses’ educational characteristics at marriage because I am interested in how educational assortative mating, that is, educational pairings of spouses at the time of marriage, shape income dynamics in couples over the marital life course. Missing data on education at marriage are imputed from the value reported in the survey year closest to their year of marriage, provided it was within the first three years of marriage (Killewald & Gough, 2013; Schwartz & Mare, 2012). Respondents’ entire person-years are dropped if their own and/or their spouses’ education at marriage are missing after imputation. 69,268 person-years are left.

Because the focus of this study is on income dynamics in couples, I restrict the analytic sample to 67,992 person years during which respondents and their spouses were of prime working age, that is, aged 18–55 years when their incomes were measured. Because measured income refers to income in the previous calendar year, a small proportion (roughly 20 percent) of respondents happened to report incomes earned in the year prior to marriage. Although incomes in the year prior to marriage shed light on individuals’ income right before marriage, the small share of respondents with such information hardly guarantee the representativeness of the data. Thus, I drop 1,502 person years in which measured incomes refer to those in the year prior to marriage. I further drop 6,824 person years that represent marital lives after more than twenty years of marriage (ranging between 21 and 36 years of marriage) because these person years comprise less than ten percent of the person-year observations and are likely very
selective. In addition, I drop 2,444 person years if respondents or their spouses served in the military during the year when incomes were measured, because the income measure (see the Measurement section for more details) does not include any money received from the military service. There are 57,222 person-year observations left in the sample.

The NLSY contains information on income, age, educational attainment, and labor supply of respondents and their spouses. Because this study uses multilevel dyad models, I convert the 57,222 person years into the person years of husbands and those of wives. The person years of husbands are based on either the interviews of the male respondents or the female respondents’ reports of their spouses’ information, and the person years of wives are obtained in a similar way. The NLSY includes a detailed fertility history of every respondent. I obtain parenthood information from fertility history data and consider it as the couple’s shared characteristics. After I drop the person years with missing data on variables used in the analysis, the sample includes 53,038 person years of husbands and 53,675 person years of wives. Note that husbands and wives differ in the number of person-year observations because missing data may exist for one spouse but not for the other spouse. As elaborated below, multilevel dyad models are well-suited to accommodate this kind of imbalanced data structure.

Measurement

Incomes. The dependent variable is the total annual incomes from wages and salary of husbands and wives (Schwartz, 2010; Winslow-Bowe, 2006). The information on spousal incomes and other characteristics is proxy data obtained from the respondents. I adjust all incomes to 2012 dollars using the CPI-U-RS from 1947 to 2013 (Schwartz,
To avoid the extreme values of incomes, I recode incomes above the 99th percentile or below the 1st percentile of the weighted distribution to the 99th and 1st percentile, respectively (Killewald & Gough, 2013). To correct for right skewness, I take the natural log of incomes. To handle zero income, I add a constant of one to each income prior to applying the log transformation.

**Marital duration.** The main independent variable is a time-varying variable—years since marriage, defined as the year in which income was measured minus the year of marriage. To capture the non-linear change in income over the course of marriage, I include both marital duration and the squared term of marital duration. Indeed, I estimated both a linear model and a quadratic model and change in the model fit statistics confirmed that the quadratic model had a significantly better fit to the data ($\chi^2 = 893.43, df = 2, p < 0.001$).

**Education.** Education is measured through two sets of variables: first, individuals’ own education—less than high school, high school diploma (reference category), some college, and college and above, and second, educational pairings of spouses reflecting individuals’ education relative to that of their spouses—educational hypergamy (husband’s education greater than that of wife), educational homogamy (husband’s education equal to that of wife; reference category), and educational hypogamy (husband’s education lower than that of wife). Indeed, variables indicating individuals’ own education are correlated with those measuring spouses’ relative education. In particular, men with less than high school education and women with college degrees would not fall into the educational hypergamy category whereas men with college
degrees and women with less than high school education would not be in the educational hypogamy category. Multicollinearity among these variables, however, is not likely to pose problems for analysis, because correlations among these variables are rather small, with a maximum value of 0.32. In addition, using educational homogamy as the reference group helps interpretation, because no matter what level of education individuals have, it would be possible for them to form educationally homogamous marriages.

I also ran supplementary analysis in which I adopted a more detailed specification of individuals’ own education and educational pairings of spouses. Specifically, instead of including three variables measuring individuals’ own education and two variables measuring educational pairings of spouses, I included fifteen variables in the model, that is, both husbands’ and wives’ educational levels (six variables) as well as full interactional terms between spouses’ education (nine variables). The analysis produced substantively the same results as I present below (more details in the Results section), but the more detailed coding of the education-related variables renders results more difficult to interpret. In addition, some combinations of husbands’ and wives’ education have very small sample sizes: for example, in the analytic sample, less than ten couples involve husbands with college degrees and wives with less than high school education. Thus, it is very difficult to get robust estimates of interactional terms indicating educational pairings of spouses with very small sample sizes. Taking substantive and statistical considerations into account, I choose to collapse educational pairings of spouses into three categories, rather than using nine interactional terms to measure them.
Note that education is a time-invariant variable measured at the time of marriage. Although at least one spouse experienced an educational transition in about a quarter of marriages (Schwartz & Mare, 2012), I do not treat education as time-varying variables for conceptual and empirical reasons. Conceptually, this study aims to understand the long-term implications of educational assortative mating for economic well-being of husbands and wives. Thus, education is well-suited to be modelled as a time-invariant variable in order to investigate how educational characteristics of both spouses at the start of marriage set stages for income dynamics in couples later on. Empirically, the NLSY asks incomes that respondents and their spouses earned prior to the survey year but education that both spouses had at the time of survey. In addition, the NLSY has changed from an annual survey to a bi-annual survey since 1994. Thus, the survey design of the NLSY79 makes it very difficult, if possible, to accurately link contemporaneous or prior status on predictors related to education with current status on the income outcome.

According to previous studies, I control for a series of demographic, employment, and life course factors in the model. Time-invariant variables include age at marriage, race, and whether the respondent was the husband or the wife. I control for husbands’ and wives’ age at marriage, because marriage timing, that is, when individuals entered marriage, is related to individuals’ own educational levels, educational assortative mating, and individuals’ career development and income trajectories (Dahl, 2010; Mare, 1991; Oppenheimer & Lim, 1997; Sweeney, 2016). I control for race because the long-term wage effect of marriage seems to differ by race, in particular for women (Cheng, 2016) and patterns of educational assortative mating may vary by race as well.
considering racial/ethnic variation in gender gaps in educational attainment (DiPrete & Buchmann, 2013). Unfortunately, the NLSY79 only collected information on race of respondents’ spouses at the 2008 and 2012 interviews. Thus, respondents who were not interviewed in these two rounds of surveys had missing data on their spouses’ race. Given the relatively small percentage of interracial marriages, I include only respondents’ own race in the analysis. Respondents’ race is measured through three categories: Hispanic, Black, and non-black, non-Hispanic (referred to as white thereafter; reference category). As I mentioned earlier, spousal information is proxy data obtained from the respondents. Whether the couple member was the respondent or not might affect the precision of the information. Thus, I include a control variable for whether the respondent was the husband (= 0) or the wife (=1).

Time-varying variables include husbands’ and wives’ employment hours as well as fertility-related variables. To measure husbands’ and wives’ labor supply, I include the number of hours that each spouse worked during the year when the income was measured. Annual work hours depend on and are highly correlated with both weeks worked during the year and usual hours worked per week (correlations greater than 0.7 for both husbands and wives). Sensitivity analysis confirmed that results were substantively the same if weeks worked or usual hours per week were used. The NLSY79 has collected fertility history data including the birth year of every child born to the NLSY79 respondents and dates of death for children who have died. Based on such information, I create a continuous measure of number of children. Following Killewald and Gough’s (2013) operationalization, I define number of children as the number of
surviving biological children (of the NLSY79 respondents) under the age of 18 years, regardless of whether the child lives in the household or not. Parental status is considered as a characteristic shared by two spouses. In other words, the parental status variable constructed from the NLSY respondents’ fertility history applies to the respondents’ spouses as well. Sensitivity analysis showed that results did not change if instead of using a continuous measure of number of children, I measured parental status through three categories—no children, one child, and two or more children (Killewald & Gough, 2013).

Analytic Strategies

Although marital timing differed across individuals, marital duration varied across couples, and the frequency of the NLSY79 has changed from annual to biennial since 1994, growth curve modeling strategies, as described in detail below, are perfectly suitable for dealing with such situations in which both the number of observations and the timing of observations vary over participants. More specifically, I use multilevel dyad models that essentially extend growth curve modeling to the dyadic context (Keizer & Schenk, 2012; Lyons & Sayer, 2005; Raudenbush & Brennan, 1995). Multilevel dyad models allow me to simultaneously estimate income trajectory of the husband and that of the wife. This modeling strategy has several advantages compared with when trajectories of the husband and the wife are estimated in separate models. First, each partner can have a unique trajectory. Multilevel dyad models allow the incongruence of the average trajectories for each spouse to be directly and formally tested for significant differences at the intercept, the slope, or both. Second, multilevel dyad models control for autocorrelation among the repeated measures as well as adjusting the error variance for
the interdependence of spousal outcomes within the same couple. Third, it allows for missing responses under the assumption that the data are missing at random. It is possible for only one spouse of the couple to contribute data or for the pattern of missing responses to be different for each spouse, which is why the total number of person-year observations can differ between husbands and wives.

**Level-1 model: within-dyad model.** \( Y_{it} = (\text{husband})[\beta_{1i} + \beta_{2i}(\text{linear}_{it}) + \beta_{3i}(\text{quadratic}_{it})] + (\text{wife})[\beta_{4i} + \beta_{5i}(\text{linear}_{it}) + \beta_{6i}(\text{quadratic}_{it})] + e_{it}, \) where \( Y_{it} \) represents logged income with \( t = 1, \ldots, K \) responses for dyad (i.e., couple) \( i \). The model consists of intercepts as well as linear and quadratic slopes for husbands and wives, separately. The intercepts \( \beta_{1i} \) and \( \beta_{4i} \) denote expected logged income at the start of marriage for the husband and wife within couple \( i \), respectively. When income is logged and a second order polynomial for quadratic change is included, the linear slope, for example \( \beta_{2i} \), means that the instantaneous rate of change in the husband’s income at the time of marriage is \( (100 \times \beta_{2i})\% \) (Singer & Willett, 2003; Stock & Watson, 2006).

An example of the data structure for one couple using dyadic multilevel modeling is shown in Table 4. Table 4 contains the level-1 record for Couple 2. This record has 12 rows. The first column gives the couple’s ID number. The second column contains logged income. The third and fourth columns contain two dummy variables that represent Husband and Wife. If Husband takes on a value of 1, it denotes that the observation is for the husband. If Wife takes on a value of 1, it denotes that the observation is for the husband wife. Thus, we note that the first six observations are for the husband; the last six, for the wife. The fifth and sixth columns are labeled Husband Linear and Wife Linear
and denote the linear time (i.e., marital duration) values for the husband and wife. The Wife Linear column has values of zero at all times for the husband. Similarly, the Husband Linear column has values of zero at all times for the wife. Finally, the seventh and eighth columns are labeled Husband Quadratic and Wife Quadratic and denote the quadratic values of marital duration for the husband and wife, which are squared terms of the linear values.
Table 4. Level-1 Record for Couple 2

<table>
<thead>
<tr>
<th>Couple ID</th>
<th>Logged Income</th>
<th>Husband</th>
<th>Wife</th>
<th>Husband Linear</th>
<th>Wife Linear</th>
<th>Husband Quadratic</th>
<th>Wife Quadratic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>11.07</td>
<td>1</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>2</td>
<td>11.04</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>11.02</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>11.19</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>11.04</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>11.08</td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>81</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>10.60</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>81</td>
</tr>
</tbody>
</table>
Unconditional level-2 model: between-dyad model. At Level 2, each estimated parameter (e.g., intercept, linear slope, or quadratic slope) consists of an estimated population average over dyads and a random effect per dyad. In the unconditional model without any covariates at Level 2, these parameters can be written as

$$\beta_{si} = \gamma_s + u_{si}$$

where $\beta_{si}$ represents the estimated parameter $s$ ($s = 1, 2, 3, 4, 5, 6$) for dyad $i$, with $\gamma$ denoting the estimated population average and $u$ denoting the random effect for parameter $s$ of dyad $i$. Time is measured in years since marriage. The time trends in these models thus indicate average changes in income over the duration of marriage.

Conditional level-2 model: between-dyad model. To examine heterogeneity in husbands’ and wives’ income trajectories across dyads, I include individuals’ own educational levels (HEDU = husbands’ education; WEDU = wives’ education) and their education relative to that of their spouses indexed by RELEDU in conditional models.

$$\beta_{1i} = \gamma_{10} + \gamma_{11}\text{HEDU} + \gamma_{12}\text{RELEDU} + u_{1i}$$
$$\beta_{2i} = \gamma_{20} + \gamma_{21}\text{HEDU} + \gamma_{22}\text{RELEDU} + u_{2i}$$
$$\beta_{3i} = \gamma_{30} + \gamma_{31}\text{HEDU} + \gamma_{32}\text{RELEDU} + u_{3i}$$
$$\beta_{4i} = \gamma_{40} + \gamma_{41}\text{WEDU} + \gamma_{42}\text{RELEDU} + u_{4i}$$
$$\beta_{5i} = \gamma_{50} + \gamma_{51}\text{WEDU} + \gamma_{52}\text{RELEDU} + u_{5i}$$
$$\beta_{6i} = \gamma_{60} + \gamma_{61}\text{WEDU} + \gamma_{62}\text{RELEDU} + u_{6i}$$

Conditional level-1 and level-2 models. Finally, I estimate a full model by adding all the covariates. The time-varying variables (number of children and annual work hours) are included at the level-1 model, and time-invariant variables (husband’s or
wife’s age at marriage, respondent’s race, and which spouse was the respondent) are included at the level-2 models. To facilitate interpretation (Singer & Willett, 2003), I center husbands’ and wives’ ages at marriage at 24 years of age. In addition, I center annual work hours by subtracting 1,750 from hours worked during the year at each spouse’s person year. Centering annual work hours at 1,750 (= 35 × 50) captures deviation from the minimum work hours of full-time, year round workers since working 35 or more hours per week and 50 or more weeks per year is usually considered as employed full-time and year-round (Bianchi, 2000).

Results

Descriptive Results

Table 5 presents the descriptive statistics of the time-invariant variables (upper panel) and time varying-variables (lower panel), for husbands and wives, respectively. About 23 percent of husbands and wives formed traditional, educationally hypergamous marriages (husband more educated than wife), 53 percent of them were in educational homogamy, and 24 percent of them were in educationally hypogamous marriages (wife more educated than husband). At the time of marriage, 18 percent, 43 percent, 20 percent, and 19 percent of the husbands had less than high school education, high school education, some college education, and college degrees, respectively. The respective figures for wives were 15%, 44%, 23%, and 18%. The mean age at marriage was about 26 years for husbands and 24 years for wives. In both the husband sample (N = 6,320) and the wife sample (N = 6,368), about 52 percent of the respondents were wives, and 19
percent, 23 percent, and 58 percent of the respondents were Hispanics, blacks, and whites, respectively.

Time-varying variables were measured at the person-year level. The mean of the dependent variable—logged income—was 10 for husbands and 7.4 for wives across their person-year observations. Marital duration (i.e., years since marriage) ranged from 0 to 20, with a mean of roughly seven years for both spouses. The number of children ranged from zero to nine, with a mean of 1.4 across person-year observations for both husbands and wives. Total hours worked during the year averaged 2,150 hours and 1,260 hours across the person years of husbands and wives, respectively.
Table 5. Descriptive Statistics of Time-Invariant (Level-2) and Time-Varying (Level-1) Variables

<table>
<thead>
<tr>
<th></th>
<th>Husbands</th>
<th></th>
<th>Wives</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Mean</td>
<td>SD</td>
<td>%</td>
</tr>
<tr>
<td><strong>Level-2 Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Educational pairings of spouses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypergamy</td>
<td>22.4</td>
<td>22.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homogamy</td>
<td>53.2</td>
<td>53.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypogamy</td>
<td>24.4</td>
<td>24.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>17.5</td>
<td>15.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>43.3</td>
<td>43.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>20.2</td>
<td>22.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>19.0</td>
<td>18.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at marriage</td>
<td></td>
<td>26.1</td>
<td>6.0</td>
<td>24.0</td>
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<tr>
<td>Respondent’s race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>19.5</td>
<td>19.4</td>
<td></td>
<td></td>
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<tr>
<td>Black</td>
<td>22.5</td>
<td>22.7</td>
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<tr>
<td>White</td>
<td>58.0</td>
<td>57.9</td>
<td></td>
<td></td>
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<tr>
<td>Respondent was wife</td>
<td>51.9</td>
<td>52.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level-1 Variables</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Logged income</td>
<td>10.0</td>
<td>2.7</td>
<td>7.4</td>
<td>4.3</td>
</tr>
<tr>
<td>Marital duration</td>
<td>7.0</td>
<td>5.5</td>
<td>7.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Number of children</td>
<td>1.4</td>
<td>1.1</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Hours worked during the year</td>
<td>2,150.0</td>
<td>757.2</td>
<td>1,260.0</td>
<td>941.7</td>
</tr>
</tbody>
</table>

*Note:* SD = Standard Deviation. Size of husband sample = 6,320 persons; 53,038 person years. Size of wife sample = 6,368 persons; 53,675 person years.
Figure 3 presents how mean logged incomes of husbands and wives changed over the marital life course among all couples, educationally hypergamous couples (husband more educated than wife), educationally homogamous couples, and educationally hypogamous couples (wife more educated than husband), respectively. X-axis represents marital duration, and Y-axis indicates mean logged income. Dash lines are for husbands, and solid lines are for wives. In the total sample, mean logged income for husbands gradually increased with marital duration, whereas mean logged income for wives was U-shaped over the marital life course, declining in the early years of marriage and then gradually increasing. A comparison of the differences in mean logged income between husbands and wives indicates that husbands outearned wives at the beginning of marriage. In addition, husband’s income advantage over wives seems to have grown over the course of marriage.

When the total sample is disaggregated by the combination of husband’s and wife’s education, income dynamics in couples clearly varied across educational pairings of spouses. Husbands’ income trajectories, in terms of income at the time of marriage and change in income within marriage, were very similar across three types of educational pairings of spouses. In contrast, wives’ income trajectories differed across three types of couples. On average, wives who were less educated than their husbands (i.e., wives in educational hypergamy) had a lower income at the start of marriage, compared with wives who had education equal to or surpassing that of their husbands (i.e., wives in educational homogamy or hypogamy). In terms of variation in long-term income trajectories, the drop in income in the early years of marriage was much less pronounced
for wives who were more educated than their husbands, compared with the drop in income for wives who had education equal to or less than that of their husbands. As a result, husbands’ income advantage over wives widened most dramatically with marital duration among educationally hypergamous couples (husband more educated than wife) and least dramatically among educationally hypogamous couples (wife more educated than husband), with educationally homogamous couples falling between the two.
Figure 3. Husbands’ and Wives’ Mean Logged Incomes over the Marital Life Course, by Educational Pairing of Spouses
Baseline Model Results

Next, I discuss results of multilevel dyad models. I originally specified the unstructured covariance matrix which allowed for all variances and covariances to be distinct. Because the multilevel dyad models in my analysis consist of six random-effects terms, the unstructured covariance matrix has 21 unique parameters (six variance components and fifteen covariance components). Similar to Keizer and Shenk (2012), because of the very high negative correlation between the random effect of linear time trend and that of the quadratic time trend for both husbands (correlation = -0.91) and wives (correlation = -0.94), I was not able to reliably estimate standard errors of the random effects. Following Keizer and Shenk (2012), I constrain the quadratic random effects to be equal over partners. As a result, all convergence issues are solved. This modeling strategy implies that while the quadratic time effects could still be different by gender within couples, the random variation of a husband’s and a wife’s quadratic time trends in logged income is constrained to be the same over couples.

I first estimate the baseline model (Model 1) which includes intercept as well as linear and quadratic slopes at Level 1 separately for husbands and wives and allows the intercepts and slopes to vary across couples. The average curves for wives and husbands are estimated to be

\[ E(Y_{it}|\text{husband}) = 9.599 + 0.044(\text{linear})_{it} - 0.001(\text{quadratic})_{it} \]

\[ E(Y_{it}|\text{wife}) = 7.839 - 0.194(\text{linear})_{it} + 0.012(\text{quadratic})_{it}. \]

The estimated average logged income at the start of marriage for husbands and wives was 9.599 (\(p < 0.001\)) and 7.839 (\(p < 0.001\)). Thus, husbands on average had
higher income than wives at the time of marriage. In addition, the results indicate that over the course of marriage, husbands’ income increased at a decreasing rate (linear term = 0.044, \( p < 0.01 \); quadratic term = -0.002, \( p < 0.001 \)) and wives’ income declined before increasing (linear term = -0.194, \( p < 0.001 \); quadratic term = 0.012, \( p < 0.001 \)).

To facilitate interpretation, the trajectories of husbands’ and wives’ incomes (in dollars) are plotted in Figure 4. As shown in Figure 4, wives’ income declined in the early years of marriage, and the rate of decline in wives’ income decreased over the course of marriage. After about eight years of marriage (= 0.194 / (0.012 \times 2)), wives’ income increased with every additional year of marital duration. Husbands’ income increased rapidly in the early years of marriage, although the rate of increase in husbands’ income appeared to decrease over time. Overall, in the first twenty years of marriage, husbands’ income increased with marital duration. Post-estimation tests indicate that husbands and wives followed different average income trajectories over the marital life course, because the differences in the intercept (\( \chi^2 = 1087.81, df = 1, p < 0.001 \)), the linear trend (\( \chi^2 = 494.76, df = 1, p < 0.001 \)), and the quadratic effect (\( \chi^2 = 551.92, df = 1, p < 0.001 \)) between wives and husbands are statistically significant.
Figure 4. Predicted Average Income Trajectories for Husbands and Wives over the Marital Life Course
Note that Figure 4 presents a very simplified summary of Model 1 because this figure does not take the random components (i.e., variance and covariance components) of the model into account. The actual level of initial income at the time of marriage and how income actually changed within marriage depend on the variance components. The variance components for the baseline model (available upon request) indicate considerable variation in the intercepts as well as the linear and quadratic trends across couples. For example, the standard deviation of the linear trend for husbands and for wives is estimated to be 0.074 and 0.283, respectively. Thus, for 95 percent of husbands, linear slopes varied between -0.101 (= 0.044 - 1.96 × 0.074) and 0.189 (= 0.044 + 1.96 × 0.074), and for 95 percent of wives, linear slopes varied between -0.749 (= -0.194 - 1.96 × 0.283) and 0.361 (= -0.194 + 1.96 × 0.283). Women were significantly more variable in their income at the time of marriage and the instantaneous rate of change in income after marriage (compare standard deviation of 3.430 and 1.688 for the intercept and standard deviation of 0.283 and 0.074 for the linear slope, respectively).

In addition, the matrix of correlations among the level-2 random effects (not shown, but available upon request) reveals shared variances in the outcomes for members of the couple. Specifically, the random effects of intercepts and linear slopes of husbands and wives were correlated: the correlation between husbands and wives was 0.346 for the intercept and 0.043 for linear change. In other words, high-earning men and women tended to marry each other and one spouse’s change in income after marriage was slightly positively related to that of the other spouse. The shared variances in the income trajectories of two spouses give evidence for the “linked lives” perspective as the initial
income at marriage and change in income after marriage were not independent between two spouses. These results also highlight the importance of taking into account the interdependence of spouses’ income trajectories.

To sum up, estimation of the baseline model has indicated several major findings regarding husbands’ and wives’ income trajectories. First, according to the fixed effects results, the average curves, in terms of income at the time of marriage and income change after marriage, significantly differed between husbands and wives. Second, there was substantial variation across couples in income trajectories, since the variance components were large and significant. Third, the matrix of correlations reveals that spouses’ initial incomes at the time of marriage and rates of change in income were positively correlated. Lastly, a comparison of the variance components for husbands and wives indicate that variation in income at the time of marriage and rate of change in income appeared to be more pronounced among wives than among husbands.

**Variation by Educational Pairing of Spouses**

Next, in Model 2, I add variables measuring educational pairings of spouses and individuals’ own educational attainment at the time of marriage at level-2 models. The results illustrate how income trajectories of husbands and wives, in terms of the intercepts, the linear slopes, and the quadratic terms, vary by husbands’ and wives’ own education and their education relative to their spouses. The results for the fixed effects are presented in Model 2 of Table 6.
### Table 6. Multilevel Dyad Model Fixed Effects Results Predicting Husbands’ and Wives’ Income Over Time

<table>
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<tr>
<th></th>
<th>Husbands Model 2</th>
<th>Husbands Model 3</th>
<th>Wives Model 2</th>
<th>Wives Model 3</th>
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Table 6 continued

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<td>Number of children</td>
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<tr>
<td>Hours worked during the year</td>
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Note: *** p < 0.001; ** p < 0.01; * p < 0.05 (two-tailed tests).
An interesting gender difference arises. For the wife, it is clear that both her own education and the education relative to her husband were significantly related to her income trajectories within marriage. Wives’ own educational attainment was positively associated with their income at the start of marriage ($b_{\text{Less than high school}} = -3.494, p < 0.001; b_{\text{Some college}} = 1.074, p < 0.001; b_{\text{College}} = 2.499, p < 0.001$). After controlling for wives’ own education, compared with wives who married similarly-educated husbands, those who married husbands with more education than themselves had higher income at the time of marriage ($b_{\text{Hypergamy}} = 0.430, p < 0.01$), whereas those who married husbands with less education than themselves had lower income ($b_{\text{Hypogamy}} = -0.544, p < 0.001$). Wives’ education relative to that of their husbands was associated with wives’ linear slope as well. After controlling for wives’ own education, compared with wives who married similarly-educated husbands, those who married husbands with more education than themselves had a more negative linear slope ($b_{\text{Hypergamy}} = -0.067, p < 0.01$), whereas those who married husbands with less education than themselves had a more positive linear slope ($b_{\text{Hypogamy}} = 0.186, p < 0.001$).

In contrast, for the husband, there were much fewer significant effects. Moreover, the husband’s change in income within marriage was more closely related to his own education than his education relative to that of his wife. In fact, none of the variables indicating husbands’ relative education were significant in predicting husbands’ linear or quadratic slope. Husbands’ relative education was significantly related to their initial income at marriage, though. After controlling for husbands’ own education, husbands who married wives with less education than themselves had lower income at the time of marriage.
marriage than either husbands who married similarly-educated wives \((b_{\text{Hypergamy}} = -0.272, p < 0.01)\) or husbands who married wives with more education than themselves \((b = (-0.272) - 0.114 = -0.386, \chi^2 = 13.39, df = 1, p < 0.001)\).

To facilitate comparisons of the variation in husbands’ and wives’ income trajectories by educational pairings of spouses, I present the predicted income in dollars for husbands and wives, respectively, in Figure 5. I set husbands’ and wives’ own education at marriage as the reference category—high school education, in order to see how income trajectories vary across educational pairings of spouses net of the effect of individuals’ own education. As shown in Figure 5, controlling for husbands’ own education, husbands in educationally hypergamous marriages (husbands more educated than wives) had significantly lower income at the start of marriage than husbands in educationally homogamous or hypogamous (wives more educated than husbands) marriages, but change in income with marital duration was very comparable across three types of educational pairings of spouses. Regardless of educational pairings of spouses, husbands’ income increased at a decreasing rate over the first twenty years of marriage.

Controlling for wives’ own educational levels, at the start of marriage, wives in educationally hypergamous marriages (husbands more educated than wives) had the highest income, wives in educationally hypogamous marriages (wives more educated than husbands) had the lowest income, and wives in educational homogamy fell between the two groups. We notice that in Figure 3, the mean logged income at the time of marriage was highest for wives in educationally hypogamous marriages (wives more educated than husbands), whereas in Figure 5, the predicted income was the lowest for
wives in educationally hypogamous marriages after controlling for their own education. Because wives in educationally hypogamous marriages were on average more educated than wives in educationally homogamous or hypergamous marriages, their higher average income in Figure 3 was largely a function of their higher educational levels.

Although wives who married husbands with less education than themselves had the lowest income at the start of marriage, their income only slightly declined in the early years of marriage and then gradually increased. In contrast, income for wives who married husbands with educational levels equal to or surpassing their own education declined more rapidly in the early years of marriage, especially for wives in traditional, educationally hypergamous marriages (husbands more educated than wives). After about the first five years of marriage, the ranking of the average income earned by these three groups of wives reversed: wives in educationally hypogamous marriages had the highest income, wives in educationally hypergamous marriage had the lowest income, and wives in educational homogamy fell between the two groups. Thus, Figure 5 clearly shows that husbands’ income earned at the start of marriage varied by the educational pairing of spouses, but how husbands’ income changed after marriage did not vary much. For wives, both their income earned at the time of marriage and change in income after marriage varied across educational pairings of spouses.
Figure 5. Predicted Average Income Trajectories for Husbands and Wives over the Marital Life Course, by Educational Pairing of Spouses
In analysis not shown here, I ran models including husband’s education, wife’s education, and full interaction terms between spouses’ education. The results were substantively the same as those reported above. For example, among wives with some college education, compared with those marrying husbands with some college education (homogamy), the initial logged income at marriage was 0.779-point lower, 0.147-point lower, and 0.230-point higher for those marrying husbands with less than high school education (hypogamy), those marrying husbands with high school education (hypogamy), and those marrying husbands with college degrees (hypergamy), respectively, and the respective figures for the linear slope were 0.078-point higher, 0.045-point higher, and 0.135-point lower. Thus, no matter whether educational pairings of spouses were modeled through three collapsed categories or through full interaction terms between spouses’ educational levels, the main story held: controlling for wives’ own education, income for wives in traditional educational hypergamy was higher at marriage but dropped more rapidly after marriage, and income for wives in educational hypogamy was higher at marriage but exhibited more positive change after marriage, compared with income for wives in educational homogamy.

**Full Model Including All Covariates**

In Model 3, I include all the covariates. The time-varying variables (number of children and total hours worked during the year) are included at Level 1, and the time-invariant variables (age at marriage, which spouse was the respondent, and respondent’s race) are included at Level 2. Similar to Model 2, husbands’ linear and quadratic slopes were not significant in Model 3. Thus, I focus on describing the results for wives below.
When comparing coefficients for hypergamy and hypogamy between Models 2 and 3, I find that after controlling for other variables, income at the time of marriage (Model 3: $b = 0.111$, $p > 0.05$) and the linear change in income (Model 3: $b = 0.000$, $p > 0.05$) no longer differed between wives in educationally hypergamous marriages (husbands more educated than wives) and wives in educational homogamy. In addition, though still significant, the linear and quadratic terms for hypogamy (wives more educated than husbands) were much attenuated after controlling for other variables. Specifically, from Model 2 to Model 3, the linear term for hypogamy changed from 0.186 to 0.041, and the quadratic term changed from -0.007 to -0.002. In models not presented here (available upon request), I added time-invariant and time-varying variables separately, and found that only adding time-invariant variables barely changed the coefficients indicating educational pairings of spouses. Instead, change in the coefficients for educational pairings of spouses from Model 2 to Model 3 among wives was mainly driven by adding time-varying variables.

Supplementary analysis shows that compared with wives in educational homogamy, wives in educationally hypergamous marriages (husbands more educated than wives) on average had slightly more children (1.42 versus 1.40) and worked fewer hours during the year (1,117 versus 1,245), whereas wives in educationally hypogamous marriages (wives more educated than husbands) had fewer children (1.34 versus 1.40) and greater annual work hours (1,428 versus 1,245). Since number of children was negative associated with wives’ income (Model 3: $b = -0.235$, $p < 0.001$) and annual work hours (Model 3: $b = 0.003$, $p < 0.001$) were positively related to wives’ income,
these two variables accounted for the more pronounced drop in income over the marital life course for wives in educational hypergamy and explained much of the more positive change in income after marriage for wives in educational hypogamy.

Although it is not central to this paper, Model 3 reveals that respondent’s race was significantly associated with both husbands’ and wives’ income at the time of marriage, but was only significantly related to changes in wives’ income after marriage. When the respondent was black, husbands’ income at marriage was significantly lower, compared with when the respondent was white or Hispanic (dif. Black-White = -0.270, p < 0.001; dif. Black-Hispanic = -0.270 - 0.024 = -0.294, $\chi^2 = 9.85$, $df = 1$, $p < 0.01$). Wives’ income at marriage was significantly lower when the respondent was Hispanic ($b = -0.346$, $p < 0.001$) or black ($b = -0.147$, $p < 0.05$), compared with when the respondent was white. The linear and quadratic terms for husbands’ logged income did not vary significantly by race of the respondent, whereas the linear slope in wives’ logged income was more positive when the respondent was Hispanic or ($b = 0.044$, $p < 0.01$) or black ($b = 0.050$, $p < 0.01$) compared with when the respondent was white. These results resonate with prior research showing that the long-term wage effect of marriage is similar between black and white men but more positive for black women than white women (Cheng, 2016).

Also note that the time-varying number of children appeared to be significantly negatively associated with husbands’ income ($b = 0.039$, $p < 0.05$), which does not seem to be consistent with prior literature documenting the “fatherhood premium” (e.g., Glauber, 2008; Hodges & Budig, 2010; Killewald, 2013). While prior research usually used fixed-effects models to identify the causal effect of parenthood on men’s income,
this study uses growth curve modeling and thus captures both the association between husbands’ income and their average number of children over time and the association between husbands’ income and the relative number of children at each point in time in comparison to the average at the individual level. In analysis not shown here, I decomposed the time-varying number of children into a time-invariant average value \( \bar{CHILD}_{t0} \) and the time-varying deviations from that average \( \bar{CHILD}_{t} - \bar{CHILD}_{t0} \) (Singer & Willett 2003). I found that the overall negative relationship between the time-varying number of children and husbands’ income was due to the negative association between husbands’ income and their average number of children over time (i.e., \( \bar{CHILD}_{t0} \)), suggesting that lower-income husbands tended to have larger family size but increases in the number of children did not hurt husbands’ incomes.

**Supplementary Analyses**

In analysis not shown, I also examined whether the variation in husband’s and wife’s income trajectories after marriage by educational pairings of spouses further differed by the respondent’s race, and I did not find significant racial/ethnic difference \( \chi^2_{Wives} = 13.05, df = 8, p > 0.05; \chi^2_{Husbands} = 11.80, df = 8, p > 0.05 \). Thus, educational pairings of spouses appeared to shape husbands’ and wives’ income change after marriage in a similar way (as depicted in Figure 5) across white, black, and Hispanic couples.

The number of person years can vary over participants in growth curve modeling, but this is free from selection bias only when such variation is random across persons (Raudenbush & Brennan 1995). However, in my case, attrition due to divorce may not be random. For example, if nonnormative marriages in which wives have more education
than their husbands and also maintain high earning capabilities are more likely to
dissolve, selection out of marriage due to divorce likely underestimates the positive rate
of change in wives’ incomes over the course of marriage. I refit the models using two
alternative samples that best capture spouses’ income trajectories among couples who
remain married: 1) respondents whose first marriage never ended and their first spouses
\(N_{\text{husband}} = 35,968; N_{\text{wife}} = 36,290\), and 2) respondents whose first marriage lasted twenty
years or longer and their first spouses \(N_{\text{husband}} = 33,942; N_{\text{wife}} = 34,243\). The main results
based on these two samples are presented in Tables 7 and 8, respectively. To save space,
I only present in Tables 7 and 8 key coefficients of interest from Models 2 and 3 (full
models available upon request). The results based on intact first marriages in Table 7 and
the results based on first marriages lasting for at least twenty years in Table 8 are similar
to those based on all first marriages in Table 6: How husbands’ income changed with
marital duration was not associated with their education relative to that of their wives,
whereas wives’ income trajectories over the course of marriage varied across educational
pairings of spouses and such variation was largely accounted for by wives’ parenthood
and labor supply characteristics. This sensitivity analyses indicate that results based on
the full sample of first-married couples apply to couples who remain married, but do not
specifically reveal spouses’ income trajectories among couples whose marriage dissolved
in the early years. Fully exploring how selection out of marriage might contribute to
variation in spouses’ income trajectories remains a task for future research. One potential
way to investigate this question is to disaggregate the person-year sample into the first
five, ten, fifteen, or twenty years of marriage and compare trajectories across subsamples.
Table 7. Multilevel Dyad Model Fixed Effects Results Predicting Husbands’ and Wives’ Income over Time, Marriages that Never Ended

<table>
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<tr>
<th></th>
<th>Husbands</th>
<th>Wives</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Model 2</td>
<td>Model 3</td>
</tr>
<tr>
<td>Intercept: Initial income at marriage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Pairing of Spouses</td>
<td></td>
<td></td>
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<tr>
<td>Homogamy (ref.)</td>
<td></td>
<td></td>
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<tr>
<td>Hypergamy</td>
<td>-0.328 **</td>
<td>0.115</td>
</tr>
<tr>
<td>Hypogamy</td>
<td>0.083</td>
<td>0.116</td>
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<tr>
<td>Linear: Marital duration</td>
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<tr>
<td>Educational Pairing of Spouses</td>
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<tr>
<td>Homogamy (ref.)</td>
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<tr>
<td>Hypergamy</td>
<td>0.015</td>
<td>0.022</td>
</tr>
<tr>
<td>Hypogamy</td>
<td>0.000</td>
<td>0.022</td>
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<tr>
<td>Quadratic: Marital duration squared</td>
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<td>Educational Pairing of Spouses</td>
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<td>Homogamy (ref.)</td>
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<tr>
<td>Hypergamy</td>
<td>0.000</td>
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<td>Hypogamy</td>
<td>0.000</td>
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<td>Note: Size of husband sample = 3,373 persons; 35,968 person years. Size of wife sample = 3,397 persons; 36,290 person years. Models 2 and 3 in this table are set up in the same way as those presented in Table 6. To save space, coefficients for other variables in Models 2 and 3 are not presented here, but full models are available upon request. ***p &lt; 0.001; **p &lt; 0.01; *p &lt; 0.05 (two-tailed tests).</td>
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Table 8. Multilevel Dyad Model Fixed Effects Results Predicting Husbands’ and Wives’ Income over Time, Marriages Lasting 20 or More years

<table>
<thead>
<tr>
<th></th>
<th>Husbands</th>
<th>Wives</th>
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<tr>
<td></td>
<td>Model 2</td>
<td>Model 3</td>
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<td>$b$</td>
<td>SE</td>
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<tr>
<td><strong>Intercept: Initial income at marriage</strong></td>
<td></td>
<td></td>
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<tr>
<td>Educational Pairing of Spouses</td>
<td></td>
<td></td>
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<tr>
<td>Homogamy (ref.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypergamy</td>
<td>-0.274 ** 0.124</td>
<td>-0.264 * 0.119</td>
</tr>
<tr>
<td>Hypogamy</td>
<td>0.041 0.124</td>
<td>-0.024 0.118</td>
</tr>
<tr>
<td><strong>Linear: Marital duration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Pairing of Spouses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homogamy (ref.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypergamy</td>
<td>-0.001 0.023</td>
<td>0.015 0.020</td>
</tr>
<tr>
<td>Hypogamy</td>
<td>0.024 0.023</td>
<td>0.030 0.020</td>
</tr>
<tr>
<td><strong>Quadratic: Marital duration squared</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Pairing of Spouses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homogamy (ref.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypergamy</td>
<td>0.000 0.001</td>
<td>0.000 0.001</td>
</tr>
<tr>
<td>Hypogamy</td>
<td>-0.001 0.001</td>
<td>-0.001 0.001</td>
</tr>
</tbody>
</table>

*Note: Size of husband sample = 2,681 persons; 33,942 person years. Size of wife sample = 2,690 persons; 34,243 person years. Models 2 and 3 in this table are set up in the same way as those presented in Table 6. To save space, coefficients for other variables in Models 2 and 3 are not presented here, but full models are available upon request. ***$p < 0.001; **p < 0.01; *p < 0.05$ (two-tailed tests).
Summary and Discussion

The decline and eventual reversal of the gender gap in education could potentially have far-reaching consequences for marriage and family lives (DiPrete & Buchmann, 2013). One consequence of the reversal of the gender gap in education is the growing number of couples in which wives are more educated than their husbands. What are the implications of the increase in the previously non-normative arrangement—educational hypogamy (i.e., marriages in which the wife has more education than the husband)—for gender economic inequality within married couples? To answer this question, this study uses data from the National Longitudinal Survey of Youth 1979 (NLSY79) and multilevel dyad models (Lyons & Sayer, 2005) to track income dynamics in couples over the first twenty years of marriage. In doing so, this paper sheds light on how the educational pairing of spouses influences the economic positions of both spouses over the course of marriage. It has several key findings.

It is often portrayed as a relatively recent phenomenon that the wife is more likely than the husband to be the more-educated spouse (Wang, 2014). Yet, the NLSY79 respondents are the late baby boomer cohort born between 1957 and 1964. Even in this cohort, the share of first marriages in which the wife had more education than the husband was already slightly higher than the share of first marriages in which the husband had more education than the wife. What are the implications of the educational pairing of spouses for income dynamics in couples?

The baseline model (Model 1) shows that the average curves, in terms of income at the time of marriage and income change after marriage, significantly differed between
husbands and wives. Specifically, the average curve of husbands’ income was inversed-U shaped such that husbands’ income increased at a decreasing rate but did not reverse direction of change within the first twenty years of marriage. In contrast, the average curve of wives’ income was U-shaped with their income decreasing for the first eight years of marriage before gradually increasing (Figure 4). In addition, results from the multilevel dyad model support the principle of linked lives in the life course framework because spouses’ incomes at the time of marriage and rates of change in income are positively related ($\text{correlation}_{\text{husband intercept, wife intercept}} = 0.346; $ $\text{correlation}_{\text{husband linear term, wife linear term}} = 0.043$).

Results from the conditional level-2 model (Model 2 in Table 6 and Figure 5) show that husbands’ income earned at the start of marriage varies across educational pairings of spouses, but change in husbands’ income with marital duration was very comparable across three types of educational pairings of spouses. For wives, both their initial income at marriage and change in income after marriage differed by educational pairings of spouses. Specifically, controlling for husbands’ or wives’ own educational levels, husbands in traditional, educationally hypergamous marriages (husbands more educated than wives) had significantly lower income at the start of marriage than husbands in educationally homogamous or hypogamous (wives more educated than husbands) marriages, whereas wives in educationally hypogamous marriages had the lowest income at the start of marriage, wives in educationally hypergamous marriages had the highest income, and wives in educational homogamy fell between the two groups. These results are consistent with prior research findings that men and women
with lower earnings were more likely to marry spouses with less education than themselves (Dribe & Nystedt, 2013).

Although wives who married husbands with less education than themselves had the lowest income at the start of marriage, their income only slightly declined in the early years of marriage and then gradually increased. In contrast, income for wives who married husbands with educational levels equal to or surpassing their own education declined more rapidly in the early years of marriage, especially for wives in traditional, educationally hypergamous marriages (husbands more educated than wives). As a result, after about the first five years of marriage, the ranking of the average income earned by these three groups of wives reversed: wives in educationally hypogamous marriages had the highest income, wives in educationally hypergamous marriages had the lowest income, and wives in educational homogamy fell between the two groups.

Adding time-varying variables measuring number of children and hours worked during the year, I find that the more pronounced drop in income after marriage for wives in educationally hypergamous marriages (husbands more educated than wives), compared with that for wives in educational homogamy, was primarily due to slightly larger number of children they had and fewer hours they worked during the year. Yet, the distinct income trajectories for wives in educationally hypogamous marriage (wives more educated than husbands) cannot be fully explained by the number of children and annual work hours. Future research is advised to investigate the role of other potential factors, such as work-family ideals, occupational characteristics, and gender divisions of household labor in shaping income trajectories of wives who married a less-educated
husband than themselves. This is an important avenue for future research as female advantage in educational attainment has grown larger among more recent cohorts than among the NLSY79 cohort. As shown in Table 1 in Chapter 2 of this dissertation, wives had more education than their husbands in about one third of newlywed couples who got married around the 2010s. Whether and how these women who had educational advantage over their husbands could maintain relative high earnings capabilities after marriage could have profound implications for gender equality in American marriages.

The results of this study reveal asymmetric effects of educational pairings of spouses on husbands’ and wives’ income trajectories over the marital life course. Change in husbands’ income with marital duration did not vary much by their educational levels relative to their wives’ education, whereas wives marrying a less-educated husbands than themselves tended to have more positive change in income after marriage, compared with wives in other educational pairings of spouses. Prior research (Winslow-Bowe, 2006) found that women who had educational advantage over their husbands were more likely to earn more than their husbands for 5 consecutive years. This study suggests that the higher likelihood of maintaining income advantage for wives who marry a less-educated husband than themselves is primarily because income of wives in this group does not drop dramatically after marriage, rather than because of differential changes in husbands’ income by educational pairings of spouses.

The limitation of this study is that it mainly provides a nuanced description of husbands’ and wives’ income trajectories and their variation by educational pairings of spouses. It is less clear what drives the income trajectories. In other words, are change in
income after marriage and variation in income change across couples due to differential bargaining power within the couple, different preferences for work-family arrangements, or institutional constraints (such as workplace policies and gender discrimination at work)? Clearly, all these processes are likely at work and couples’ decisions and even preferences could be shaped by institutional constraints that they face in the workplace and the society at large (Becker & Moen, 1999; England, 2016; Pedulla & Thébaud, 2015). Future research could incorporate workplace characteristics of both spouses to better disentangle and quantify the contribution of individual-, couple-, and contextual-level factors in shaping economic gender inequality over the marital life course.

In conclusion, this study is unique in that it examines the impact of educational pairings of spouses on income dynamics in couples from a dyadic and longitudinal perspective. These results suggest that it remains important for husbands to bring income into the family no matter what educational levels they have relative to their wives, whereas the rise of women’s education and the increasing prevalence of educational hypogamy (wife is more education than the husband) likely protect women from earning less after marriage. The results support the uneven nature of gender change—women’s lives have changed more than men’s (England, 2010; Sayer et al., 2011).
Chapter 4: Educational Assortative Mating and Trajectories of Change in Female Breadwinning Status

As women’s labor force participation has increased and the gender pay gap has narrowed over the past decades (Blau & Kahn, 2007; England, 2010), there is growing interest in understanding how wives’ incomes relative to their husbands have changed. In particular, much media and scholarly attention has focused on couples in which wives earn more than their husbands. For example, prior studies have examined the period change in the prevalence of couples where the wife provides the majority of the couple’s income. Using repeated cross-sectional data from the Current Population Survey, Raley and colleagues (2006) find that between 1970 and 2001, couples in which the wife contributed 60 percent or more income tripled from two percent to seven percent among all married couples in which both spouses were aged 25–54 years. Similarly, a recent Pew Research Report on the “New Economics of Marriage” finds that between 1970 and 2007, among all married couples where at least one spouse is U.S.-born and aged 30 to 44 years, “wives contribute a growing share of the household income, and a rising share of those couples include a wife who earns more than the husband (Taylor et al., 2010: p.12).” In light of these new economics of heterosexual marriage, the media portray women as “the richer sex” and ask how the gender role reversals in the spousal
characteristics are changing the norm that the husband is the primary breadwinner (Mundy, 2013).

In this paper, I argue that we need to better conceptualize female breadwinning before we investigate the consequences of wives as the primary breadwinners for families, gender relations, and societal norms. Because marriage often lasts for years or even decades, there are diverse ways that husbands and wives negotiate divisions of paid and unpaid labor. Accordingly, breadwinning arrangements in marriage are dynamic in nature. Studies that use cross-sectional data to examine breadwinning arrangements, however, assess each couple at a single point in time (e.g., Klesment & Bavel, 2015; Raley et al., 2006; Taylor et al., 2010). Thus, the complex, long-term patterns of breadwinning arrangements over the marital life course are not well understood.

Some progress has been made in assessing change in breadwinning arrangements over several years of marriage. Recent longitudinal research has investigated whether women outearn their husbands for multiple years and revealed that wives’ income advantage over their husbands is hardly persistent (Drago et al., 2005; Winkler et al., 2005; Winslow-Bowe, 2006). For example, while about ten percent of wives earned 60 percent or more of the couple’s total income in a given year, less than half of them did so for three consecutive years, and only a quarter of them did so over a five-year period (Winkler et al., 2005; Winslow-Bowe, 2006). These longitudinal studies, however, operationalize female breadwinning as either a transitory or persistent phenomenon within a short time window. That is, these longitudinal studies categorize patterns of female breadwinning status into two types: 1) temporary female breadwinning
arrangement in which wives earn more than their husbands during the first year of the study but do not continue to do so in the following years, and 2) persistent female breadwinning arrangement in which wives consistently outearn their husbands during the short time period under study. In other words, patterns of female breadwinning status are assumed a priori in existing longitudinal studies and are generally conceptualized as two dichotomous scenarios. This body of research examines couples’ breadwinning arrangements for only a limited period of time and largely overlooks the variation across couples in timing and duration of having wives as the primary breadwinners over the course of marriage. Research on multiperiod transitions that occur over long time frames, also known as trajectories, is much-needed.

Closely related to the increase in female labor force participation and decline in the gender pay gap, the reversal of the gender gap in education is probably a more pronounced change in gender inequality. Historically women lagged behind men in college completion but since 1982, the gender gap in obtaining college degrees has reversed from favoring men to favoring women (Buchmann & DiPrete, 2006). Women’s gains in education have resulted in significant changes in marriage patterns: from the late 1980s onwards, when newlywed spouses differ in education, it has been more likely that the wife is better educated than the husband (Schwartz & Mare, 2005). Would women married to men with less education than themselves challenge the traditional breadwinner role of men in the family? Would wives’ educational advantage over their husbands shape the patterns of female breadwinning status over the course of marriage? These questions shed light on the extent to which gender roles in marriage are reversed and
have important implications for gender equality and power dynamics among heterosexual couples, but remain unanswered.

In addressing the above limitations and unanswered questions, the current study uses data from the National Longitudinal Survey of Youth 1979 to investigate the ideal-type trajectories of change in female breadwinning status over the first twenty years of marriage. Instead of categorizing couples into either transitory or persistent female-breadwinning couples, I use group-based trajectory models to identify groups of couples that follow distinct trajectories of change in female breadwinning status over the marital life course. Specifically, group-based trajectory models generate (1) a finite number of trajectory groups that characterize the developmental course of the outcome, in this case whether or not wives are the primary breadwinners, and (2) the size of each group as measured by the percentage representation of each group in the population (Nagin, 2005: p.185). In addition, I analyze how individual- and couple-level factors at the time of marriage are related to the trajectory group membership. As discussed above, in light of the striking reversal of the gender gap in educational attainment (DiPrete & Buchmann, 2013), I focus on whether educational assortative mating (i.e., relative education of the husband and wife at the time of marriage) has long-term implications for trajectories of change in breadwinning arrangements over the course of marriage.

In contrast to either transitory or persistent female-breadwinning arrangements, I find that patterns of change in female breadwinning status can be summarized in six ideal-type groups: 1) 68 percent of couples have continuously low probability of female breadwinning over the marital life course; 2) ten percent of couples have initially high but
rapidly declining probability of female breadwinning; 3) eight percent of couples have initially low and later increasing probability of female breadwinning; 4) six percent of couples have an inverse-U shaped probability of female breadwinning; 5) five percent of couples have fairly high probability of female breadwinning over the course of marriage; and 6) three percent of couples have a probability of female breadwinning that is initially low but rapidly increasing to stably high. I then explore the association between membership in these groups and educational assortative mating, holding a variety of other factors constant. I find that educational assortative mating does have implications for long-term trajectories of female breadwinning status in marriage: relative to continuously bearing the non-breadwinning role, wives marrying husbands with less education than themselves are more likely than those marrying husbands whose educational levels equal or exceed their own to have a continuously high probability of being breadwinners in families and also more likely to gradually or rapidly become breadwinners if initially they are not.

In sum, this study focuses on distinctive trajectories of change in female breadwinning status over the course of marriage rather than on wives’ income advantage over their husbands at one point in time or within a short time window. This research allows us to better understand the diversity and prevalence of various long-term breadwinning arrangement patterns across marital years. This study also enhances our theorizing about wife-advantaged relationships and spurs future research to advance understanding of specific groups (such as couples in which wives gradually or rapidly become breadwinners even though they are not at the time of marriage). The findings of
this study underscore that research and theory on the economics of marriage and gender relations in families would benefit from a more dynamic conceptualization of breadwinning arrangements in marriage.

Theoretical Frameworks

To examine patterns of change in female breadwinning status over the marital life course, I draw on the life course perspective and the new home economics as theoretical frameworks. The life course perspective emphasizes the dynamic nature of individuals’ life experiences as well as the heterogeneity of individuals’ life trajectories (Elder, 1975). In addition, one of the central principles of the life course perspective is that of linked lives, which implies that mutual influences are constantly at work so that one’s life trajectory is influenced by significant others (Elder, 1998; Elder et al., 2003).

The life course perspective guides the empirical analysis of this study in several ways. First, the life course perspective’s emphasis on longitudinal change in life experiences suggests that breadwinning arrangements within married couples are not static. Whether wives are the primary breadwinners or not is dynamic in nature, considering that men and women experience cumulative disadvantage or disadvantage in the labor market over time (Cheng, 2014) and that two spouses of the couple have continuing negotiations regarding divisions of paid and unpaid labor over the course of marriage (Becker & Moen, 1999). Thus, this study investigates how female breadwinning status changes as marriage unfolds.

Second, according to the life course perspective’s emphasis on heterogeneity of life trajectories, this study uses group-based trajectory models to investigate the distinct
trajectories of change in female breadwinning status that couples follow and factors that are associated with heterogeneity in trajectories. In group-based trajectory models, heterogeneity in trajectories is described by a small number of distinctive groups that are defined by their size and shape (Nagin, 2005: p.185).

Finally, the principle of linked lives suggests that whether wives are the primary breadwinners or not depends on not only wives’ own attributes but also those of their husbands. Thus, this study moves from an individual- to a couple-based analysis to investigate breadwinning arrangements in marriage. A couple-based analysis is critical because it is not just whether women increase their participation in the labor market or how much income they earn that determines whether or not they are the primary breadwinners in the family. Rather, the central force is how two spouses reconcile their working and family lives given the institutional constraints that they face in the labor market and the society at large (England, 2016; Pedulla & Thébaud, 2015; Warren, 2000). Specifically, sociodemographic characteristics of the husband and wife at the time of marriage, such as educational attainment, age, and race, differ across couples. Those characteristics create differential constraints and opportunities for couples and might thus shape the patterns of change in female breadwinning status through influencing spouses’ labor market positions, labor supply decisions, as well as the frequency and timing of life events such as childbirth. While this study does not explore the negotiation processes between the spouses or the mechanism through which the trajectories emerge (e.g., changes in spouses’ parental status or labor supply and the gender pay gap in the society), it investigates which characteristics of wives and those relative to their husbands at the
time of marriage shape couples’ subsequent trajectories of change in female breadwinning status. In particular, this study investigates whether and how educational assortative mating that determines wives’ education relative to their husbands shapes the trajectories of change in female breadwinning status over the course of marriage.

Why and how might educational assortative mating shape the trajectories of change in female breadwinning status over the marital life course? According to the new home economics, gender divisions of labor within families, with each spouse specializing in the sector in which he or she has comparative advantage, maximize the household utility (Becker, 1981). Historically, husbands tended to have more education and invest more in human capital than wives, and thus husbands usually occupied the breadwinning role in the family. In contrast, wives complimented their husbands by specializing in the private sphere, rearing children, and taking care of the home. If income patterns are partly a result of intrahousehold specialization, individuals’ own educational attainment and that relative to their spouses may shape long-term income dynamics in couples. Admittedly, married couples, even dual-earner couples, usually make work-family decisions that prioritize husbands’ careers over the life course (Becker & Moen, 1999). Wives likely have a comparative advantage in the labor market among couples in which the wife is more educated than the husband, especially considering that educational attainment has been increasingly tied to economic success in American society (Fischer & Hout, 2006; Hout, 2012). Thus, compared with couples in which the wife has education equal to or less than that of the husband, couples in which the wife has more education than the husband may be less likely to adopt work-family strategies that prioritize husbands’
careers. In short, the new home economics suggest that wives’ educational advantage over their husbands is likely translate into their higher chances of becoming and even maintaining the primary breadwinner role in the family.

Previous Research on Female Breadwinner Families

Prior research has used cross-sectional data to examine the prevalence of female breadwinner families in the United States by assessing each couple at one point in time. Results show that the share of couples in which the wife is the primary breadwinner increased in recent decades but was still a small minority in the 2000s. Working wives, on average, earned less than one-third of total family income at the end of the twentieth century (Nock, 2001). By 2001, about two thirds of married couples were traditional couples in which husband contributed 60 percent or more of the couple’s income whereas wives contributed 60 percent or more income among seven percent of couples (the rest of the couples, about 27 percent, were co-provider couples in which the husband’s and wife’s contributions were both between 40 percent and 60 percent; Raley et al., 2006).

Existing studies have also examined the persistence of wives’ income advantage over their husbands within a limited time window. Winkler and colleagues (2005) used the 1996–2000 Survey of Income and Program Participation (SIPP) and investigated whether wives consistently outearned their husbands for three years. Similarly, Winslow-Bowe (2006) used the 1990–1994 waves of the National Longitudinal Survey of Youth 1979 to examine persistence of wives’ income advantage over their husbands over a five-year period. Both studies found that among the majority of the couples, the nontraditional arrangement where wives outearned their husbands did not persist through the years.
under study. While about ten percent of wives earned 60 percent or more of the couple’s total income in a given year, less than half of them did so for three consecutive years, and only a quarter of them did so over a five-year period (Winkler et al., 2005; Winslow-Bowe, 2006). In addition to using a limited time window, both studies (Winkler et al., 2005; Winslow-Bowe, 2006) pooled couples at various durations of marriage and used the calendar year as the time metric to assess persistence of female breadwinning status over time. Thus, it is not clear how female breadwinning status changes with marital duration. In contrast to prior longitudinal research, this study conceptualizes change in female breadwinning arrangements as trajectories and uses formal statistical models to identify distinct trajectories that couples follow over the first twenty years of marriage.

Studies on the prevalence and persistence of female breadwinner families found that controlling for other factors, relative education of the husband and wife was associated with wives’ single-year and consistent income advantage over their husbands. Women in marriages where the wife has more education than the husband were more likely than women in other types of marriages to earn more than their husbands in a single year and for several consecutive years (Klesment & Bavel, 2015; Raley et al., 2006; Winkler et al., 2005; Winslow-Bowe, 2006). Building on prior research, this study examines whether educational assortative mating (i.e., relative education of the husband and wife at the time of marriage) sets couples on different trajectories of change in female breadwinning status.
Method

Data

I use data from the National Longitudinal Survey of Youth 1979 (NLSY79) to examine how female breadwinning status changes over the marital life course. The NLSY79 is a nationally representative sample of 12,686 young men and women who were 14–22 years old when they were first surveyed in 1979. The survey was conducted annually through 1994 and is currently carried out on a biennial basis. When the cohort was first surveyed, many of them just began to transition from school to work and to form heterosexual unions. At the time of their 2012 interviews, when the most recent data are currently available, the respondents were 47–56 years of age and approaching the end of their prime working-age years (Bureau of Labor Statistics, 2016). Because close to 90 percent of the respondents (11,117 out of 12,686) were never married at the time of the first interview, a particular advantage of the NLSY79 is that the vast majority of the respondents can be tracked from the beginning of their first marriages. In sum, the NLSY79 provides a unique opportunity to study income dynamics in couples among the late baby boomer cohort born between 1957 and 1964 over almost the entire marital life course during which both partners were of active working age.

There are several advantages of the NLSY79 over other longitudinal datasets such as the Panel Study of Income Dynamics (PSID) and the Survey of Income and Program Participation (SIPP). First, the NLSY79 covers a long period of time spanning over three decades, whereas the duration of each SIPP panel is much shorter and only ranges from 2.5 years to 4 years. Second, the PSID and SIPP survey nationally representative samples
of U.S. families and interview all household members age 15 years and older (SIPP; The U.S. Census Bureau, 2016) or all persons regardless of age living in the PSID families (PSID Main Interview User Manual, 2015). Patterns of educational and income assortative mating, gender inequalities in educational attainment, and individuals’ (in particular women’s) employment patterns along the life course differ considerably across birth cohorts, which likely leads to cohort variations in couples’ income dynamics (see Chapter 2 of this dissertation; DiPrete & Buchmann, 2013; Percheski, 2008; Raley et al., 2006; Sweeney & Cancian, 2004; Winkler et al., 2005). Data from the PSID or SIPP do not allow me to capture the earlier years of marriage in older birth cohorts or to observe the couples in younger birth cohorts for an extended period of time. In addition, the more recent cohorts in the PSID or SIPP samples are likely a selective group who married at relatively young ages. In contrast, analyses that focus on one birth cohort could better illustrate changes over the marital life course while minimize variation arising from the cohort effects. Moreover, the NLSY79 allows me to examine a large sample of the late baby boomer cohort who received education, entered the labor force, and formed marriages during the period when the most rapid changes in women’s economic and family roles occurred (Goldin, 2004). Finally, prior research has used the NLSY79 to examine wives’ income advantage over a limited period of time (i.e., five years; Winslow-Bowe, 2006). Thus, by examining husbands’ and wives’ income dynamics in the NLSY79 sample, the current study not only provides some comparability with prior research but also extends the existing literature.
Sample

I restrict my analysis to the cross-sectional sample 
\(N = 6,111\) and the supplementary sample of Hispanics and blacks 
\(N = 3,652\), which consist of 9,763 respondents. Note that the cross-sectional sample of 6,111 respondents was designed to represent the noninstitutionalized civilian segment of people ages 14 to 22 and living in the United States in 1979. Respondents in the cross-sectional sample and the supplementary sample of Hispanics and blacks have been eligible for interview during each round of the NLSY79. I drop the military sample 
\(N = 1,280\) and the supplementary sample of economically disadvantaged, nonblack/non-Hispanic respondents 
\(N = 1,643\) because these subsamples have not been followed throughout the entire survey period.

Among the 9,763 respondents, about 80 percent of them have ever entered their first marriage since the first interview whereas less than 25 percent of them have ever started their second marriage and only about 5 percent of them have ever married for the third time. Second and higher-order marriages are more selective than first marriages because first marriages do not necessarily dissolve and individuals, particularly women, do not necessarily remarry after marital dissolutions (Shafer & James, 2013). Whether trajectories of female breadwinning status vary by marriage order is an empirical question that awaits future research. The current study focuses on trajectories of female breadwinning status in first marriages.

Because I am interested in female breadwinning arrangements in marriage, I drop 1,885 respondents from the sample if they have never been married since they were first interviewed. I also drop 215 respondents from the sample if the year when their first
marriage started is missing because their entry into first marriage cannot be accurately
determined. Among the 7,663 respondents left in the sample, I further limit the sample to
7,209 respondents who have at least one person-year observation for which the NLSY79
respondents were in their first marriages with spouse present.

I need educational levels of both spouses at marriage because I am interested in
how educational assortative mating (i.e., relative education of the husband and wife at the
time of marriage) shapes trajectories of female breadwinning status over the marital life
course. Missing data on education at marriage are imputed from the value reported in the
survey year closest to their year of marriage, provided it was within the first three years
of marriage (Killewald & Gough, 2013; Schwartz & Mare, 2012). I drop respondents if
their own and/or their spouses’ education at marriage are missing after imputation. 6,816
respondents are left in the sample.

Because this study focuses on trajectories of female breadwinning status, I only
examine the years of first marriages during which respondents and their spouses were of
working age, that is, aged 18–55 years when their incomes were measured. In addition,
person years in the NLSY data that represent marital lives after more than twenty years of
marriage are very selective since they comprise only about ten percent of the person-year
observations. Thus, I focus on examining trajectories of female breadwinning status over
the first twenty years of marriage during which both respondents and their spouses were
between 18 and 55 years of age. 6,630 respondents contribute at least one such person-
year observation to the analytic sample. After I drop respondents with missing data on the
variables used in the analysis, the final sample includes 6,494 respondents.
Note that although the sample size is described as number of respondents, the unit of analysis of this paper is essentially couples. The NLSY contains information on income, age, and educational attainment of respondents and their spouses. Based on the reports from 6,494 respondents, I am able to construct records of 6,494 marital couples. Thus, this study identifies groups of couples that follow distinctive patterns of change in the likelihood of wives outearning their husbands over the marital life course and further examines how group membership relates to individual- and couple-level characteristics.

**Measurement**

The time varying measure of *female breadwinning status* is created based on husbands’ and wives’ annual incomes from wages and salary. Following prior research (Raley et al., 2006; Winkler et al., 2005; Winslow-Bowe, 2006), I code female breadwinning status as 1 if the wife earns 60 percent or more of the couple’s total income and 0 otherwise. A cut-off of 50 percent is not used here because those wives who earn more than 50 percent but less than 60 percent of the couple’s total income are more accurately considered as coproviders (Nock, 2001). When describing results, I refer to wives who earn 60 percent or more of the couple’s income as “breadwinner” or “primary earner” (those two terms are used interchangeably in this paper).

*Marital duration.* The time metric is represented by years since marriage, defined as the year in which income was measured minus the year of marriage.

After identifying distinctive trajectory groups within the population, this study links individual- and couple-level characteristics to the probability of trajectory group membership. Because the trajectories describe the long-term course of an outcome, the
predictors of group membership should be established by the time of the initial period of
the trajectories (Nagin, 2005). Thus, all the variables described below are time-invariant
variables that were measured approximately at the time of marriage. Using this analytic
strategy, this study helps understand how individual- and couple- level characteristics at
the start of marriage set stages for the income dynamics in couples later on and thus
assesses the long-term implications of those characteristics for economic gender
inequality within couples.

The predictor of main interest is *educational assortative mating*. I first group
husbands’ and wives’ educational attainment into four categories—less than high school,
high school diploma, some college, and college and above. Second, based on a
comparison between the husband’s and wife’s education measured through four
educational categories, I create three dummy variables to measure *educational
assortative mating*—educational hypergamy (wife’s education lower than that of
husband), educational homogamy (wife’s education equal to that of husband; reference
category), and educational hypogamy (wife’s education greater than that of husband). In
addition to educational assortative mating which is a relative measure of the husband’s
and wife’s education, I also control for *wives’ educational attainment* measured through a
set of dummy variables—less than high school, high school (reference category), some
college, and college degrees. Indeed, variables measuring *educational assortative mating*
are correlated with those indicating wives’ educational attainment. In particular, couples
in which the wife has a college degree would not possibly fall into the educational
hypergamy category whereas couples in which the wife has less than high school
education would not be in the educational hypogamy category. Multicollinearity among these education-related variables, however, is not likely to pose problems for analysis, because correlations among these variables are rather small, ranging from -0.31 to 0.27.

According to previous studies, I control for a series of socio-demographic factors in the model. I first control for race of the NLSY79 respondents and this variable is measured through three categories: Hispanic, Black, and non-black, non-Hispanic (referred to as white thereafter; reference category). Unfortunately, the NLSY79 only collected information on race of the respondents’ spouses in the 2008 and 2012 waves. Thus, respondents who were not interviewed in these rounds of the survey have missing data on spouses’ race. Given the relatively small share of interracial marriages, I only include respondents’ race in the analysis.

In addition, I control for gender of the NLSY79 respondent. The information on spousal incomes and other characteristics is proxy data obtained from the respondent. Whether the wife or the husband was the respondent might affect the precision of the information. Thus, I include a control variable for whether the respondent was the husband (= 0) or the wife (=1).

Women’s age at marriage and spousal age gap might influence accumulation of human capital and shape marital power over the long term (Carmichael, 2011). Thus, I control for wife’s age at marriage as a continuous variable. For the ease of interpretation, I center wife’s age at marriage by subtracting 24 which is approximately the sample mean of this variable from every observation. In addition, following Lamidi and colleagues (2015), I include a set of dummy variables to measure spousal age gap: wife older than
husband by two or more years (wife older), husband older than wife by five or more years (husband older), and otherwise (similar; reference category).

Preliminary analysis also examined the effect of whether the couple cohabited before marriage and whether the NLSY79 respondent had children before marriage on the probability of trajectory group membership. Neither variable was significantly related to the probability of trajectory group membership ($\chi^2_{\text{cohabitation}} = 5.32, df = 4, p > 0.05$; $\chi^2_{\text{premarital_b}irth} = 0.25, df = 4, p > 0.05$). Thus, I do not include these variables in the models presented below, but results with these two variables are available upon request.

**Methods**

Group-based trajectory models, also known as latent class growth models (Muthén, 2004), are a specialized application of a statistical method called finite mixture modeling (Nagin, 2005; Nagin & Odgers, 2010a). The statistical model specifies that the population is composed of a mixture of unobserved groups. The conceptual aim of group-based trajectory models is to identify a finite number of discrete, meaningful subgroups within a population that follow distinctive trajectories that are not identifiable ex ante. In addition, group-based trajectory models provide the statistical capacity for addressing the question that what factors distinguish trajectory group membership.

It is worth noting that group-based trajectory models are different from conventional growth curve models which adopt a hierarchical modeling approach (Bryk & Raudenbush, 1992). Growth curve models focus on the population mean trajectory and assume that the trajectories of individual population members vary continuously around this mean, usually according to the multivariate normal distribution. Thus, growth curve
models are well suited for analyzing developmental processes in which population members follow a common developmental pattern of either increase or decline (e.g., language acquisition) and sort out factors accounting for variation around a population mean. By contrast, group-based trajectory models focus on identifying different trajectory shapes and on examining how the prevalence of the shape relates to predictors.

Group-based trajectory models have been used to study a range of substantive issues, including trajectories of physical aggression (Nagin & Odgers, 2010b), women’s employment patterns (García-Manglano, 2015; Hyens & Clarkberg, 2005), patterns of change in relationship satisfaction (Anderson et al., 2010; Don & Mickelson, 2014; Kamp Dush et al., 2008; Lavner & Bradbury, 2010), disability or mortality trajectories (Aktaş & Finch et al., 2014; Zheng et al., 2011; Zimmer et al., 2012), and the evolution of fertility expectations (Hayford, 2009). In this paper, I use group-based trajectory models to identify subgroups following similar trajectories of female breadwinning status over the marital life course. The group-based trajectory models are estimated using a Stata plugin—\texttt{traj}—developed by Jones and Nagin (2013).

Group-based trajectory models are maximum likelihood-based statistical models and can be used to analyze censored data, count data, and binary data. The models estimate group-specific parameters that capture distinct trajectories as well as the proportion of the population in each group. In this paper, I use a dichotomous dependent variable, specifically $1 =$ female breadwinner status, and $0 =$ otherwise. Thus, group-based trajectory modeling uses a logit type equation, as illustrated in Equation [1], to estimate the probability of observing the outcome $y$, for individual $i$ at time $t$, given
membership in group $j$ (Nagin, 2005). The estimated parameters ($\beta$’s) estimate the shape of a trajectory, where in this case each of the $j$ trajectories describes the probability of outcome $y$ as a polynomial function of time. In Equation [1], the likelihood of female breadwinning status at time $t$ is estimated as a function of the linear, quadratic, and cubic terms of the couple’s marital duration. The parameters of the polynomial are group-specific and the order of the polynomial describing trajectories may vary across groups as well. Both of these features allow for the possibility of distinctive trajectory shapes across groups. In addition to the parameters ($\beta$’s) that estimate trajectory shapes, group-based trajectory models estimate another set of important parameters of interest, $\pi_j$, indicating the proportion of the population making up each group $j$ (Nagin, 2005).

$$p^j(y_{it}) = \frac{e^{\beta_0^j + \beta_1^j \text{Duration}_{it} + \beta_2^j \text{Duration}_{it}^2 + \beta_3^j \text{Duration}_{it}^3}}{1 + e^{\beta_0^j + \beta_1^j \text{Duration}_{it} + \beta_2^j \text{Duration}_{it}^2 + \beta_3^j \text{Duration}_{it}^3}}$$

[1]

**Analytic Strategies**

The objective of group-based trajectory models is to identify subgroups that follow distinctive trajectories. The Bayesian Information Criterion (BIC) is used for model selection regarding the number and shapes of trajectories. The choice of number of groups is usually more important than the choice of the order of the polynomial describing trajectory for each group. Nagin (2005) has recommended a two-stage model selection process. The first stage focuses on determining the number of groups that should be included in the model. In this stage, models are estimated over varying numbers of groups starting from one group, with all trajectories specified as cubic functions. The number of groups is identified in the preferred model that ideally has the
maximum (i.e., least negative) BIC score and contains no more groups than is necessary to capture the distinct features of the data (Nagin, 2005). Given the first-stage decision on the number of groups, the second stage focuses on determining the preferred order of the polynomial specifying the shape of each trajectory. Following this model selection process, I first determine the appropriate number of groups by estimating a series of cubic models with different numbers of groups. Next, I test the functional form of each trajectory and determine whether each trajectory is best described by cubic, quadratic, linear, or zero-order terms. The trajectories identified can be thought of as measuring the prototypical development path of trajectory group members.

After identifying distinctive trajectory groups within the population, I examine which individual- and couple- level characteristics are linked to the probability of trajectory group membership. Group-based trajectory modeling uses the binary logit function or the multinomial logit function (depending on the number of groups) to simultaneously estimate the association of the time-invariant variables with the probability of membership in group $j \ (\pi_j)$ and the trajectories themselves (Nagin, 2005). This analysis allows me to investigate whether a specific characteristic affects the probability of group membership $\pi_j$, controlling for other variables in the model. The main focus of this part of analysis is to investigate whether the educational pairing of spouses distinguishes trajectory group membership, controlling for other factors.
Results

Descriptive Results

Table 9 shows the descriptive statistics of the time-invariant variables used in the analysis. These statistics present a snapshot of the characteristics of the couples at the time of marriage. Not surprisingly, the majority of the couples, 53 percent of them, involved two spouses with similar levels of educational attainment (homogamy). In this sample of the NLSY79 cohort members’ first marriages, if two spouses differed in their educational attainment at the time of marriage, the wife was already slightly more likely than the husband to be the more educated spouse: About 23 percent of the couples were the traditional, educationally hypergamous couples in which the husband is more educated than the wife, whereas 24 percent of the couples formed educationally hypogamous marriages in which the wife is more educated than the husband.

The majority of the wives in the sample did not attend college: about fifteen percent of wives had less than high school education at the time of marriage and almost 44 percent of wives had high school education. In addition, 23 percent of wives had some college education and eighteen percent of them were college graduates. Not shown in Table 9, the percentages of husbands with less than high school education, high school education, some college education, and college degrees were 17%, 44%, 20%, and 19%, respectively.

In this sample, 58 percent of the NLSY79 respondents were whites and 23 percent and 19 percent of them were blacks and Hispanics, respectively. The weighted percentages of whites, blacks, and Hispanics among the NLSY79 respondents in the 1979
wave were 80%, 14%, and 6%, respectively. Because I include the supplementary sample of blacks and Hispanics in the analysis, the share of blacks and Hispanics was greater than the national average for the NLSY79 cohort. Wives’ age at marriage ranged from 13 to 54 years, with a mean of 23.9 years and a median of 23 years. Only four couples in the sample involved wives who got married at very age young ages (i.e., 13 or 14 years of ages) and excluding them from the analytic sample did not change the results. In about thirteen percent of the couples, wives were at least two years older than husbands, and in about twenty percent of the couples, husbands were older than wives by five or more years. In the majority of the couples, husbands and wives were of similar ages: In more than two-thirds of the couples, husband-wife age difference was greater than -2 and smaller than 5. Wives were the NLSY79 respondents in about 53 percent of the couples.
Table 9. Descriptive Statistics of Time-Invariant Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>%</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Median</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education Assortative Mating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypergamy</td>
<td>22.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homogamy</td>
<td>53.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypogamy</td>
<td>24.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife’s Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>15.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>43.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>22.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College or above</td>
<td>17.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respondent’s Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>57.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>23.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>19.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife’s age at marriage</td>
<td>23.9</td>
<td>5.5</td>
<td>13</td>
<td>23</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td>Spousal age gap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife older</td>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similar</td>
<td>67.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife younger</td>
<td>20.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respondent was wife</td>
<td>51.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: SD = Standard Deviation. N = 6,494.
Figure 6 presents the average percentage of couples in which the wife earns 60 percent or more of the couple’s total income over the first twenty years of marriage. In fourteen percent of couples, wives were the primary breadwinners at the time of marriage, and the percentage declined to about eleven percent by the fifth year of marriage. The percentage remained relatively flat at about ten percent between the sixth and the thirteenth year of marriage and increased slightly after that. Overall, the percentage of couples in which the wife earns 60 percent or more of the couple’s total income peaked at the time of marriage, but only less than fifteen percent of couples had this arrangement regardless of marital duration.
Figure 6. Percentage of Couples in which the Wife Earns 60 Percent or More of the Couple’s Total Income over the Marital Life Course
Patterns of Change in Female Breadwinning Status

The average percentage of the couples in which the wife earns 60 percent or more of the couple’s total income ranges from 9.9 percent in the tenth year of marriage to 14.3 percent at the time of marriage. From Figure 6, we cannot tell how the likelihood of female breadwinning in these couples changes over the first twenty years of marriage, because the average percentages mask a high degree of heterogeneity. Next, I use group-based trajectory models to identify groups that follow distinctive trajectories of change in female breadwinning status. I first estimate models of a cubic function of time (i.e., marital duration, or in other words, years since marriage) with varying numbers of groups. Then, I determine the number of groups based on BIC statistics. In addition to comparing BIC across models, I also consider whether or not adding one more group furthers the substantive understanding of how female breadwinning status changes over the marital life course.

Table 10 reports the BIC statistics for models made up of one to seven groups. Two BIC scores are reported: one for a sample size of 6,494 couples and another for a sample size of 55,536 valid person-year observations of marriage. Model selection should be based on both BIC calculations (Nagin, 2005). The results show that both BIC calculations select the six-group model as best. Specifically, for either \( N \), BIC becomes less negative as the number of groups increases from one to six groups and BIC declines from six to seven groups. Indeed, differences in BIC statistics between the six-group model and the five- or seven-group models are substantively meaningful, because the Bayes factors \( (= \exp(\text{BIC}_i - \text{BIC}_j)) \) far exceed 10 and provide strong evidence in favor of
the six-group model (Nagin, 2005). More importantly, the predicted trajectories confirm that, compared with the six-group model, there is no new distinct trajectory emerged from the seven-group model. Thus, models with more than six groups do not further our substantive understanding of the trajectories of female breadwinning status.

Table 10. Using BIC to Select the Number of Groups to Include in the Model

<table>
<thead>
<tr>
<th>Number of groups</th>
<th>BIC ((N = 6,494))</th>
<th>BIC ((N = 55,536))</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-19,891</td>
<td>-19,895</td>
</tr>
<tr>
<td>2</td>
<td>-16,305</td>
<td>-16,315</td>
</tr>
<tr>
<td>3</td>
<td>-15,895</td>
<td>-15,910</td>
</tr>
<tr>
<td>4</td>
<td>-15,502</td>
<td>-15,523</td>
</tr>
<tr>
<td>5</td>
<td>-15,372</td>
<td>-15,398</td>
</tr>
<tr>
<td>6</td>
<td>-15,349</td>
<td>-15,380</td>
</tr>
<tr>
<td>7</td>
<td>-15,401</td>
<td>-15,437</td>
</tr>
</tbody>
</table>
After choosing the six-group model of cubic functions as the preferred model, based on the significance of the parameter estimates, I test different polynomial functions of marital duration for each group. Reducing a cubic function to a quadratic function for one of the six groups turns out to improve the model fit (BIC\(_{6,494} = -15,266\); BIC\(_{55,536} = -15,296\)). Thus, the best model specification presented below includes one group represented as a quadratic function and the other five groups represented as cubic functions. The predicted trajectories of female breadwinning status generated by the best model are shown in Figure 7. Note that trajectories in this six-group model without covariates other than the time metric measure the prototypical path of trajectory group members, averaged over all the factors that might cause individual variation around this developmental course (Nagin, 2005: p.124).

In Figure 7, the x-axis represents marital duration, that is, years since marriage formation, and the y-axis shows the probability of wives contributing 60 percent or more income. The groups are arranged from the most common one to the least common one, based on the predicted percentage distribution of trajectory group membership. I have named the six groups based on the shape of the trajectory, so that readers can vividly recall how the probability of female breadwinning changes over the marital life course for each of the six groups. The groups are 1) low and stable, indicating continuously low probability of female breadwinning over the marital life course, 2) moderately high to stably low, indicating initially high but rapidly declining probability of female breadwinning, 3) stably low before increasing, indicating initially low and later increasing probability of female breadwinning, 4) inverse-U, indicating an inverse-U
shaped probability of female breadwinning, 5) *high to moderately high*, indicating a relatively stable group of fairly high probability of female breadwinning, and 6) *low to stably high*, indicating initially low but rapidly increasing to stably high probability of female breadwinning.

Group 1 (*low and stable*) is the largest group among the six and includes 68 percent of the couples. This group is represented with flat trajectories running across the bottom of Figure 7. Among these couples, the probability of wives as the primary earners is close to zero throughout the marital life course. Group 2 (*moderately high to stably low*) is the second largest group, although it is much smaller than Group 1, and includes ten percent of the couples. Among these couples, the probability of female breadwinning begins as high as 0.6 at the time of marriage but drops rapidly after marriage to a level close to zero and does not rebound within the time period I examine. Note that this trajectory has a slight upward curve on the right side, suggesting that the probability of female breadwinning among these couples may increase in the later years of marriage. The pattern for Group 3 (*stably low before increasing*), which includes 8 percent of the couples, appears to be the inverse of Group 2. The probability of female breadwinning remains below 0.2 in the first ten years of marriage and then increases gradually above 0.6. Group 4 (*inverse-U*) includes six percent of the couples and exhibits an inverted-U shaped trajectory of female breadwinning. Among these couples, the probability of female breadwinning is close to zero at the time of marriage, but increases immediately after marriage before declining to very low levels again. Notably, despite increases after marriage, the probability of female breadwinning never exceeds 0.5 in this group. Group
5 (high to moderately high) includes five percent of the couples. Despite some fluctuations, the probability of female breadwinning in this group remains relatively high, roughly ranging between 0.5 and 0.8. Group 6 (low to stably high) is the least common group and includes only three percent of the couples. Among these couples, although the probability of female breadwinning is lower than 0.1 at the time of marriage, it increases rapidly after marriage, as evidenced by the steep upward slopes on the left side of the trajectory. Following the precipitous increase, the probability of female breadwinning for Group 6 remains high, hovering around 0.9. Groups 2 through 6 are substantially less common than Group 1. Indeed, more than two-thirds of the couples belong to Group 1 where wives have virtually no chance of becoming the primary earners in the family over the first twenty years of marriage.
Figure 7. Trajectories of Female Breadwinning Status, Predicted Values from a Six-Group Model
I conducted a series of sensitivity analyses to test the robustness of the results (available upon request). First, as spousal information is proxy data reported by the NLSY79 respondents, additional analysis indicates that the probability of female breadwinning tends to be higher when the wife was the NLSY79 respondent, compared with when the husband was the NLSY79 respondent. I ran separate group-based trajectory models by NLSY79 respondents’ gender, and the number and shape of the preferred trajectory groups did not substantively vary across these samples. Second, among 6,494 marriages examined in this study, 3,408 of those marriages never ended. To the extent that income dynamics in couples might be related to marital dissolution, differential attrition due to divorce might bias the results. To test whether the results are robust to sample attrition, I ran the group-based trajectory models based on a sample of 3,408 marriages that never ended, and the number and shape of the preferred trajectory groups remained very similar to the results described above. Third, I include the supplementary sample of blacks and Hispanics in the main analysis, but I also ran group-based trajectory models using weights from the initial 1979 sample in order to more closely represent the national population of this cohort in 1979 (Hayford, 2009). These weights do not account for sample attrition, though. In addition to conducting sensitivity analysis using weights, I also excluded the supplementary sample of blacks and Hispanics to run the group-based trajectory models. Results remain similar across these analyses, except that using weights or excluding the supplementary sample of blacks and Hispanics resulted in a slight change in the shape of Group 5 (high to moderately high):
the probability of female breadwinning exhibited a more pronounced drop in the later years of marriage, instead of hovering at the moderately high levels as shown in Figure 7.

How does the probability of female breadwinning status relate to the wife’s share of the couple’s total income? To better understand the wives’ contribution to the family income by trajectory groups, I present wives’ average share of the couple’s total income for each of the six trajectory groups in Figure 8. Clearly, the shapes of the wives’ income share shown in Figure 8 resemble the trajectories of female breadwinning status shown in Figure 7. Specifically, for couples in Group 1 (low and stable), the probability of wives as the primary earners is close to zero throughout the twenty years of marriage. Correspondingly, the wives’ income share remains well below 60 percent, ranging between 22 percent to 32 percent, during this time period. For couples in Group 2 (moderately high to stably low), wives on average contribute about 70 percent to the couple’s total income at the time of marriage, but the wives’ income share drops rapidly after marriage and remains about 30 percent. For couples in Group 3 (stably low before increasing), the wives’ average income contribution stays below 40 percent in the early years of marriage, and then gradually increases to roughly 70 percent. For couples in Group 4 (inverse-U), the shape of changes in wives’ income share is also inverse-U shaped, increasing from one-third to about two-thirds at the peak and then gradually dropping to about one-third again. For couples in Group 5 (high to moderately high), the average share of wives’ income remains above 60 percent during almost the entire time period under consideration, expect for the last three years of marriage. For couples in Group 6 (low to stably high), the wives’ average income contribution is about 40 percent
at the time of marriage, steadily increases to 80 percent, and remains well above 60 percent across the rest of the marital years.
Figure 8. Wives’ Average Share of Couples’ Total Income over the Marital Life Course, by Trajectory Group
Next, I examine the characteristics associated with trajectory group membership. In particular, how does educational assortative mating shape the long-term trajectory of female breadwinning status, controlling for other characteristics at the time of marriage? To answer this question, I incorporate time-invariant variables into the group-based trajectory model. Because there are six distinctive trajectory groups identified in the prior analysis, the probability of trajectory group membership is modelled to vary according to the multinomial logit model (Nagin, 2005). The coefficient estimates reported in Table 11 measures how the individual- and couple-level characteristics at the time of marriage are associated with the probability of membership in the particular trajectory group relative to membership in Group 1 (low and stable). For ease of interpretation, I present both log odds of being in Group 2 (moderately high to stably low), Group 3 (stably low before increasing), Group 4 (inverse-U), Group 5 (high to moderately high), and Group 6 (low to stably high) relative to membership in Group 1 (low and stable) as well as the corresponding odds ratios. Because the reference group is characterized by very low probability of female breadwinning throughout the entire twenty years of marriage, this analysis reveals what characteristics would increase the likelihood of wives as the primary earners for at least some time in marriage. All the results described below are statistically significant at the 0.05 level.
Table 11. Characteristics Associated with Trajectory Group Membership, Results based on the Multinomial Logit Model

<table>
<thead>
<tr>
<th></th>
<th>Group 2 Versus Group 1</th>
<th>Group 3 Versus Group 1</th>
<th>Group 4 Versus Group 1</th>
<th>Group 5 Versus Group 1</th>
<th>Group 6 Versus Group 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>OR</td>
<td>Coef.</td>
<td>OR</td>
<td>Coef.</td>
</tr>
<tr>
<td>Education Assortative Mating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypergamy</td>
<td>0.16</td>
<td>1.17</td>
<td>-1.04</td>
<td>***</td>
<td>0.35</td>
</tr>
<tr>
<td>Homogamy (ref.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypogamy</td>
<td>-0.07</td>
<td>0.93</td>
<td>0.76</td>
<td>***</td>
<td>2.14</td>
</tr>
<tr>
<td>Wife’s Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>-1.09</td>
<td>***</td>
<td>0.34</td>
<td></td>
<td>0.55</td>
</tr>
<tr>
<td>High school (ref.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>0.06</td>
<td>1.07</td>
<td>0.06</td>
<td>1.07</td>
<td>-0.37</td>
</tr>
<tr>
<td>College or above</td>
<td>0.75</td>
<td>***</td>
<td>2.11</td>
<td>-0.41</td>
<td>0.66</td>
</tr>
<tr>
<td>Respondent’s Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (ref.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>-0.05</td>
<td>0.95</td>
<td>0.47</td>
<td>*</td>
<td>1.60</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.24</td>
<td>0.79</td>
<td>-0.08</td>
<td>0.92</td>
<td>0.32</td>
</tr>
<tr>
<td>Wife’s age at marriage</td>
<td>-0.07</td>
<td>***</td>
<td>0.93</td>
<td>0.03</td>
<td>1.03</td>
</tr>
<tr>
<td>Spousal age gap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife older</td>
<td>0.93</td>
<td>***</td>
<td>2.53</td>
<td>-0.22</td>
<td>0.81</td>
</tr>
<tr>
<td>Similar (ref.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife younger</td>
<td>-0.73</td>
<td>**</td>
<td>0.48</td>
<td>0.43</td>
<td>*</td>
</tr>
<tr>
<td>Respondent was wife</td>
<td>0.42</td>
<td>***</td>
<td>1.52</td>
<td>0.58</td>
<td>***</td>
</tr>
</tbody>
</table>

*Note: Coef. = Coefficients (indicating log odds); OR = Odds Ratio. ***p < 0.001; **p < 0.01; *p < 0.05 (two-tailed tests).
According to Table 11, educational assortative mating is related to the long-term trajectories of breadwinning arrangements in marriage. Specifically, compared with educationally homogamous couples, educationally hypergamous couples in which the husband is more educated than the wife are 65 percent less likely to be in Group 3 (stably low before increasing) and 74 percent less likely to be in Group 6 (low to stably high) ($b = -1.04, p < 0.001, \text{OR} = \exp(b) = 0.35; b = -1.36, p < 0.01, \text{OR} = \exp(b) = 0.26$), whereas educationally hypogamous couples in which the wife is more educated than the husband are 114 percent more likely to be in Groups 3 and 103 percent more likely to be in Group 6 ($b = 0.76, p < 0.001, \text{OR} = \exp(b) = 2.14; b = 0.71, p < 0.01, \text{OR} = \exp(b) = 2.03$). Recall that Groups 1, 3, and 6 all have very low probability of female breadwinning at the time of marriage. However, in contrast to Group 1 in which the probability of female breadwinning is close to zero over the marital life course, couples in Group 3 have an increased likelihood of female breadwinning (as high as 0.7) later in marriage. In addition, among the couples in Group 6, the likelihood of female breadwinning increases steadily from almost zero to 0.9 and stabilizes at 0.9 thereafter. Among couples in which wives are not the primary earners at the time of marriage, when compared with those marrying similarly-educated husbands, wives marrying more-educated husbands are less likely to become the primary earners after marriage whereas wives marrying less-educated husbands are more likely to become the primary earners, relative to maintaining the non-breadwinning status over the marital life course.
In addition, educationally hypogamous couples in which the wife is more educated than the husband are more than twice as likely as couples in which the wife is similarly- or less-educated than the husband to be in Group 5 (\textit{high to moderately high}) \((b_{\text{hypogamy-homogamy}} = 0.96, p < 0.001, \text{OR} = \exp(b) = 2.60; b_{\text{hypogamy-hypergamy}} = 0.96 - 0.06 = 0.90, \chi^2 = 17.85, df = 1, p < 0.001, \text{OR} = \exp(b) = 2.46)\). Recall that in contrast to Group 1 characterized by a flat trajectory running across the bottom of Figure 7, Group 5 is represented by a trajectory starting and hovering at the upper end of Figure 7. Thus, wives in educational hypogamy (wife more educated than husband) are more likely than those in educational homogamy or hypergamy (husband more educated than wife) to have a continuously high probability of being the primary earners in the family, relative to continuously bearing the non-breadwinning role.

I conduct additional analysis to compare Group 2 (\textit{moderately high to stably low}) and Group 5 (\textit{high to moderately high}). Although these two groups both start with relatively high probabilities of female breadwinning, the probability drops rapidly to almost zero for Group 2 while remains relatively high over the marital life course for Group 5. Thus, comparing between these two trajectory groups is equivalent to examining the likelihood of losing versus maintaining breadwinning status for wives after marriage. Results show that educationally hypogamous couples in which the wife is more educated than the husband are more than twice as likely as couples in which the wife has an educational level equal to or lower than that of the husband to be in Group 5 relative to Group 2 (\(b_{\text{hypogamy-homogamy}} = 1.03, \chi^2 = 19.28, df = 1, p < 0.001, \text{OR} = \exp(b) = 2.80; b_{\text{hypogamy-hypergamy}} = 1.13, \chi^2 = 13.50, df = 1, p < 0.001, \text{OR} = \exp(b) = 3.10)\). In other
words, when starting marriage with high probabilities of female breadwinning status, educationally hypogamous couples (wife more educated than husband) are more likely than other couples to maintain, relative to losing, the female breadwinning arrangement as marriage continues.

Other covariates are associated with trajectory group membership as well. Compared with wives with high school education, those with less than high school are 66 percent less likely to be in Group 2 (moderately high to stably low) \((b = -1.09, p < 0.001, \text{OR} = \exp(b) = 0.34)\), and those with at least a college degree are 111 percent more likely to be in Group 2 \((b = 0.75, p < 0.001, \text{OR} = \exp(b) = 2.11)\), relative to being in Group 1. Recall that the difference in the trajectories of Group 2 and Group 1 is that Group 2 starts with high probabilities of female breadwinning. In addition, wives with at least a college degree are also more likely than those with high school education or less to be in Group 5 (high to moderately high), relative to Group 1 \((b_{\text{college-high school education}} = 0.42, p < 0.05, \text{OR} = \exp(b) = 1.51; b_{\text{college-less than high school}} = 0.42 - (-0.72) = 1.14, \chi^2 = 7.47, df = 1, p < 0.01, \text{OR} = \exp(b) = 3.13)\). Meanwhile, wives’ educational attainment seems to be negatively associated with membership in Group 3 relative to Group 1 \((b_{\text{college-less than high school}} = -0.41 - 0.55 = -0.96, \chi^2 = 7.98, df = 1, p < 0.01, \text{OR} = \exp(b) = 0.38)\). Couples in Group 1 and Group 3 have similarly low probabilities of female breadwinning in the early years of marriage, but couples in Group 3 have increased probabilities of female breadwinning later in marriage which are much higher than the sustained, low probabilities among Group 1. Taken together, wives’ higher educational attainment, in particular receipt of a college degree prior to marriage, is associated with their increased likelihood of being
primary earners either in the early years of marriage or continuously over the marital life course. In addition, highly-educated wives who are not the primary earners in the early years of marriage seem to be less likely than their less-educated counterparts to become the primary earners later in marriage.

There are profound differences in trajectory group membership between whites and blacks whereas there are no significant differences between whites and Hispanics. Compared with white respondents, black respondents are more likely to be in Group 3 (stably low before increasing), Group 4 (inverse-U), Group 5 (high to moderately high), and Group 6 (low to stably high), relative to Group 1 (low and stable). Recall that couples in Groups 3, 4, 6 all have increased probabilities of female breadwinning after marriage and couples in Group 5 have relatively stable, high probabilities of female breadwinning over the marital life course. Thus, compared with couples with a white spouse, those with a black spouse are more likely to move towards female breadwinning arrangements after marriage or to continuously have wives as the primary earners.

Wives’ age at marriage is associated with decreased odds of being Group 2 (moderately high to stably low) and increased odds of being Group 5 (high to moderately high), relative to being Group 1 (low and stable). Thus, as women marry later, they are more likely to be and remain to be the primary earners in marriage, and less likely to precipitously transition out of breadwinning status after marriage.

Spousal age gap matters too. Relative to couples involving two spouses of similar age, couples in which wives are at least two years older than their husbands are more likely to be in Group 2 (moderately high to stably low), and couples in which wives are
younger than their husbands by five or more years are less likely to be in Group 2, relative to Group 1 (low and stable). Thus, wives marrying husbands two or more years younger than themselves have a higher likelihood of female breadwinning in the early years of marriage, but the breadwinning status is short-lived. In addition, compared with couples in which two spouses are of similar age, couples in which wives are younger than their husbands by five or more years are more likely to be in Group 3 (stably low before increasing), Group 4 (inverse-U), and Group 6 (low to stably high), relative to Group 1 (low and stable). Couples in Groups 3, 4, 6 all have increased probabilities of female breadwinning after marriage. Thus, if starting with very low probabilities of female breadwinning, couples in which wives are much younger than their husbands are more likely than those in which two spouses are of similar ages to experience increases in the probability of wives as the primary earners after marriage.

Summary and Discussion

As women’s labor force participation has increased and the gender pay gap has narrowed over the past decades (Blau & Kahn, 2007; England, 2010), much media and scholarly attention has focused on female-breadwinning couples in which wives earn more than their husbands (e.g., Mundy, 2013; Tichenor, 2005). Patterns of female breadwinning status are assumed a priori in existing longitudinal studies and are generally conceptualized as two dichotomous scenarios: 1) temporary female breadwinning arrangement in which wives earn more than their husbands during the first year of the study but do not continue to do so in the following years, and 2) persistent female breadwinning arrangement in which wives consistently outearn their husbands.
during the short time period under study (Drago et al., 2005; Winkler et al., 2005; Winslow-Bowe, 2006). Advancing prior research, the current study uses group-based trajectory models to identify groups of couples that follow distinct trajectories of change in female breadwinning status over the first twenty years of marriage. Thus, this study not only examines couples’ breadwinning arrangements over an extended period of time, but also identifies qualitatively distinct patterns of female breadwinning status that are not readily identifiable using ad hoc, ex ante classification rules. Results of group-based trajectory models do reveal that trajectories of change in female breadwinning status that couples follow over the marital life course are much more heterogeneous than the two dichotomous scenarios that are often assumed in prior research.

Consistent with the life course perspective, this study finds both change in female breadwinning status over the course of marriage and great heterogeneity in the trajectories that couples follow. In contrast to the two dichotomous scenarios that are often assumed in prior research, this study finds that patterns of change in female breadwinning status can be summarized in six ideal-type groups. Prior research finds that wives contribute 60 percent or more to the couple’s total income among only a small minority of couples (Raley et al., 2006; Winkler et al., 2005; Winslow-Bowe, 2006). This study reveals results that are consistent with but also advance prior findings: more than two-thirds of couples have continuously low probability of female breadwinning over the marital life course. In other words, the majority of couples do not have a female breadwinning arrangement at any point in time over the first twenty years of marriage. In another group, the probability of female breadwinning never exceeds 0.5, though it is not
always as low as zero. This group comprises six percent of couples and follows an inverted-U shaped trajectory of female breadwinning. The rest of the couples, about one-quarter, likely achieve female breadwinning in marriage. Among ten percent of the couples, the probability of female breadwinning begins as high as 0.6 at the time of marriage but drops rapidly after marriage to a level close to zero and does not rebound within the time period I examine. Among eight percent of the couples, the probability of female breadwinning remains below 0.2 in the first ten years of marriage and then increases gradually above 0.6. For only five percent of couples, the probability of female breadwinning remains relatively high, roughly ranging between 0.5 and 0.8. The least common group includes only three percent of couples. Among these couples, although the probability of female breadwinning is lower than 0.1 at the time of marriage, it increases rapidly after marriage and hovers around 0.9. Thus, heterogeneity in trajectories of female breadwinning over the marital life course is reflected in the way couples differ in their likelihood, timing, and duration of having wives as the primary breadwinners.

In addition, consistent with the principle of linked lives emphasized in the life course perspective, this study finds that membership in trajectory groups depends on not only wives’ characteristics such as age and education but also the relative traits of the husband and wife. In light of the striking reversal of the gender gap in education, this study investigates the implications of educational assortative mating for long-term trajectories of female breadwinning status in marriage. Consistent with the new home economics, this study finds that relative to continuously bearing the non-breadwinning role, wives marrying husbands with less education than themselves are more likely than
those marrying husbands whose educational levels equal or exceed their own to have a continuously high probability of being the primary earners, and also more likely to gradually or rapidly transition into the primary earners if initially they are not. These results suggest that the rise of women in education and the associated change in educational assortative mating likely decrease the size of the group in which wives are not the primary breadwinners over almost the entire marital life course.

Overall, the findings of this paper suggest that the glass is half-full and half-empty. On the one hand, wives’ educational advantage over their husbands appears to be associated with their high likelihood of occupying the breadwinner role for at least some time in marriage. On the other hand, the vast majority of the couples have virtually no chance of having wives as the breadwinners over the marital life course, despite that wives have education equal to or exceeding that of their husbands among about 75 percent of couples. The reversal of the gender gap in education has just begun to appear in the NLSY79 cohort. Not surprisingly, in this cohort, if two spouses differ in education, it is only slightly more likely for wives than for husbands to be the better educated spouse. When data are available, future research is necessary that empirically examines whether couples in more recent cohorts follow similar trajectories of change in female breadwinning status and how the size of each trajectory group changes. In addition, to improve women’s economic positions relative to their husbands, future research, in particular qualitative and ethnographic research, can more closely examine how spouses negotiate and reconcile working and family lives among couples that have relatively stably high probability of female breadwinning over the marital life course. Finally,
another fruitful avenue for future research is to uncover the underlying mechanisms that lead couples into different trajectories of breadwinning arrangements.

Wives’ income advantage over their husbands has implications for power dynamics, marital relations, gender equality, and social norms surrounding gender roles in marriage. For example, research has found that wives’ income advantage over their husbands is associated with increased risks of marital dissolution, more traditional division of housework in the family, worse midlife health for husbands, and a higher likelihood of engaging in infidelity for husbands (e.g., Bittman et al., 2003; Kalmijn, et al. 2007; Munsch, 2015; Springer, 2010). Unfortunately, prior research has only assessed the implications of female breadwinning status at one point in time. The findings of this study indicate that female breadwinning arrangements are dynamic and heterogeneous. In addition, wives’ educational advantage over their husbands tends to be associated with their higher likelihood of continuously being breadwinners or becoming breadwinners later in marriage. Thus, future research is needed to investigate the implications of dynamic change in female breadwinning status and wives’ double advantage in both education and income over their husbands for a wide range of outcomes. In sum, the findings of this study underscore that research and theory on the economics of marriage and couple relations in families would benefit from a more dynamic conceptualization of breadwinning arrangements over the course of marriage.
Chapter 5: Conclusion

Women have made greater gains in educational attainment than men over the past few decades in the United States. Women lagged behind men in college completion before the 1980s, but since 1982, women have overtaken men in college graduation rates (Buchmann & DiPrete, 2006). With continued increases in women’s education, by 2013 women earned about 60 percent of bachelor’s and master’s degrees and half of all doctoral degrees (Digest of Education Statistics, 2015; DiPrete & Buchmann, 2013). The implications of the gender-gap reversal in education for marriage and family lives have recently received growing scholarly attention (Esteve, 2012; Klesment & Van Bavel, 2015; Schwartz & Han, 2014). This dissertation tackles this important and timely issue of the rising female advantage in educational attainment and its consequences in the realm of marriage and family. Specifically, in this dissertation, I have examined the complex interplay between educational pairings of spouses and the evolution of their relative incomes across their married lives. In Chapter 2, I have investigated how education interacts with income to shape patterns of assortative mating (i.e., who marries whom) among newlywed couples. In Chapter 3, I have examined how educational assortative mating, captured by relative education of the husband and wife at the time of marriage, shapes husbands’ and wives’ income trajectories over the course of marriage. In Chapter 4, I have explored trajectories of female breadwinning status over the marital life course.
and how the trajectories are related to educational assortative mating. This dissertation has several key findings.

The findings of Chapter 2 reveal both changes and continuities in assortative mating. Results from log-linear models show that between 1980 and 2008–2012, gender asymmetry in educational assortative mating reversed from a tendency for women to marry up to a tendency for women to marry down in terms of education, whereas the tendency for women to marry up in income remained evident, although the tendency declined over the period. Meanwhile, when considering how education and income jointly shape assortative mating patterns, I find that men and women tended to avoid status reversal in the mate selection process. Log-linear analyses show that the tendency for women to marry up in income was greater among couples in which the wife’s education level equals or exceeds that of the husband than among couples in which the wife has less education than the husband. Moreover, the variation in the tendency for women to marry up in income across educational pairings of spouses did not change between 1980 and 2008–2012. These findings suggest that men and women continue to form marriages in which the wife’s socioeconomic status does not exceed that of the husband (Bertrand, Kamenica, & Pan, 2015; England, 2011; Graf & Schwartz, 2011).

Findings of Chapter 2 resonate with those of Chapter 3. Analyzing data from the National Longitudinal Survey of Youth 1979 (NLSY79), I find that controlling for their own educational attainment, men and women married to spouses with less education than themselves tended to have lower initial income at the time of marriage. Thus, given their educational levels, women with lower earning capabilities and men with higher earning
capabilities likely form educational hypogamy in which the wife is more educated than the husband (Dribe & Nystedt, 2013).

Using multilevel dyad models to examine husbands’ and wives’ income trajectories over the first twenty years of marriage, Chapter 3 shows that husbands’ and wives’ incomes changed after marriage in differential ways. Husbands’ income increased at a decreasing rate but did not reverse direction of change within the first twenty years of marriage, whereas wives’ income decreased for the first eight years of marriage before gradually increasing. Moreover, Chapter 3 reveals that change in income after marriage was shaped by educational assortative mating in differential ways for husbands and wives. Educational assortative mating is captured by three types of educational pairings of spouses: educational hypergamy in which the wife is less educated than the husband, educational homogamy in which both spouses have same levels of education, and educational hypogamy in which the wife is more educated than the husband. Change in husbands’ income with marital duration was similar regardless of educational pairings of spouses, whereas change in wives’ income varied by educational pairings of spouses such that wives in educational hypogamy exhibited more positive change in income over the marital life course.

With women’s rising educational attainment and income, much media and scholarly attention has focused on families in which wives are the primary breadwinners (e.g., Klesment & Van Bavel, 2015; Mundy, 2013; Munsch, 2015; Tichenor, 2005). In Chapter 4, I use group-based trajectory models to identify groups of couples that follow distinct trajectories of change in female breadwinning status over the first twenty years of
marriage. Results reveal great heterogeneity in trajectories of female breadwinning status across couples. In addition, educational assortative mating plays a role in shaping patterns of female breadwinning status: educationally hypogamous couples are less likely than educationally homogamous or hypergamous couples to follow the traditional trajectory characterized by virtually no chance of achieving a female breadwinning arrangement over the first twenty years of marriage.

The decline and eventual reversal of the gender gap in education could potentially have far-reaching consequences for marriage and family lives (DiPrete & Buchmann, 2013). One consequence of the reversal of the gender gap in education is the growing number of couples in which wives are more educated than their husbands. What are the implications of the increase in the previously non-normative arrangement—educational hypogamy (i.e., marriages in which the wife has more education than the husband)—for economic gender inequality in marriage? In addressing this question, this dissertation provides an empirical assessment regarding gender change in heterosexual marriages. First, this dissertation suggests that changes in gender inequality have occurred in both public and private arenas over the past few decades. Chapter 2 shows that between 1980 and 2008–2012, accompanied by the reversal of the gender gap in education from a male advantage to a female advantage, gender asymmetry in educational assortative mating changed from a tendency for men to marry down in education to a tendency for women to marry down in education. The gender pay gap that favors men declined in recent decades, but was not eliminated (Blau & Kahn, 2007). Correspondingly, the tendency for women to marry up in income weakened but persisted between 1980 and 2008–2012. Thus,
changes in gender inequality in education and paid work spill over into personal relationships (Graf & Schwartz, 2011) and impact who marries whom.

Second, this dissertation also suggests that change in the gender system has been uneven such that it affects women more than men (England, 2010). Chapter 3 finds asymmetric effects of educational assortative mating on husbands’ and wives’ income trajectories over the marital life course. The findings suggest that it remains important for husbands to bring income into the family no matter what educational levels they have relative to their wives, whereas the rise in women’s education and in prevalence of educational hypogamy (in which the wife is more educated than the husband) likely protects women from earning less after marriage. Thus, the results from Chapter 3 support the uneven nature of gender change—women’s lives have changed more than men’s (England, 2010; Sayer et al., 2011).

Third, this dissertation suggests that there is still a long way to go in achieving economic gender equality in marriage. Results from Chapter 4 show that although wives had education equal to or exceeding that of their husbands among about 75 percent of the couples under examination, almost 70 percent of the couples had virtually no chance of achieving a female breadwinning arrangement at any point in time over the first twenty years of marriage. The smaller amount of money women bring into the household relative to their husbands would likely lead to women’s subordinate status and lower bargaining power in the family, as well as increased risk of falling into poverty after divorce or widowhood (England, 2003; Holden & Smock, 1991). Admittedly, Chapter 4 also finds that wives’ educational advantage over their husbands appeared to be associated with
their high likelihood of occupying the breadwinner role for at least some time in
marriage. These results suggest that the rise of women in education and the associated
change in educational assortative mating likely decrease the size of the group in which
wives are not the primary breadwinners over almost the entire marital life course.

Overall, in terms of economic gender equality in American marriages, my
dissertation indicates that the glass is half full and half empty. On the one hand, the
convention of mate selection that embodies male dominance was less entrenched in
2008–2012 than in 1980, but has not been completely eroded. In addition, women’s
higher educational levels relative to their husbands could indeed translate into more
positive change in their incomes and their higher likelihood of bearing the breadwinning
role at least for some time after marriage. On the other hand, there is evidence that men
and women continue to form marriages in which the wife’s socioeconomic status does
not exceed that of the husband. The expectation for husbands to bring income to the
family is more rigid than that for wives, and female breadwinning arrangement is much
less common than male breadwinning arrangement. We know that social change takes
time. With women’s growing educational advantage over men, marriages in which the
wife has higher education than the husband may continue to grow. This could potentially
help maintain women’s earnings capabilities and economic gender equality after
marriage. In addition, couples’ decisions and even preferences regarding work-family
arrangements depend on not only couples’ attributes but also institutional constraints,
such as workplace policies, gender discrimination at work, and social and cultural norms
regarding gender roles (Becker & Moen, 1999; England, 2016; Pedulla & Thébaud,
2015). In other words, institutional factors play an important role in shaping economic gender inequality over the marital life course. With their growing prevalence, the previously nonnormative marriages in which the wife has more education and/or higher income than the husband may become more socially acceptable as well (Schwartz & Han, 2014). This dissertation also suggests that more institutional policies that facilitate work-family balance and the sharing of parental leave between the two spouses are needed so that the glass could be full and equal partnerships could be the new norm and practice.

The reversal of the gender gap in educational attainment could potentially have implications for marriage formation and couple relations. Through nuanced analyses of educational assortative mating and income dynamics in couples over the marital life course, this dissertation advances understanding of consequences of the gender-gap reversal in education for economic gender equality in marriage. It is a fruitful avenue for future research to investigate how educational assortative mating and income dynamics in couples could together shape power dynamics, marital relations, and social norms surrounding gender roles in marriage.


England, Paula, Garcia-Beaulieu, Carmen, & Ross, Mary. (2004). Women’s employment among blacks, whites, and three groups of Latinas: Do more privileged women have higher employment? *Gender & Society, 18*(2), 494-509.


Appendix A: Comparisons between Newlyweds and Prevailing Marriages

Table 12 compares newly-contracted first marriages and prevailing first marriages to illustrate how the educational and income pairings of spouses differ between these two samples. Clearly, income pairings of spouses differ substantially across the two samples. In 1980, the correlation between husbands’ and wives’ income deciles was 0.26 among newlyweds, indicating positive assortative mating on income. In contrast, among prevailing marriages, the correlation between spouses’ income was negative in 1980 (consistent with Schwartz 2010: Fig. 2 on p.1540). In 2008–2012, the correlations between spouses’ income deciles were positive for both newlyweds and prevailing marriages, but the correlation was much smaller in magnitude among prevailing marriages (0.07) than among newlyweds (0.38). Additionally, in both time periods, the share of couples in which the husband is in a higher income decile than the wife (i.e., income hypergamy) was larger among prevailing marriages than among newlyweds, whereas the percentages of couples in which two spouses are in the same income decile (i.e., income homogamy) or the wife is in a higher income decile than the husband (i.e., income hypogamy) were lower among prevailing marriages than among newlyweds. In terms of the educational pairing of spouses, the correlation between spouses’ education was slightly lower among prevailing marriages than among newlyweds in 2008–2012. In both time periods, the percentages of couples in which the wife’s education level equals
or surpasses that of the husband (i.e., educational homogamy and hypogamy, respectively) were lower among prevailing marriages than among newlyweds.

Taken together, the differences in the correlations and the percentage distributions indicate that using prevailing marriages, as opposed to newlyweds, in the analysis will severely underestimate the degree of marital sorting on income as well as the incidence of non-normative marriages in which the wife has more education or higher income than the husband.
Table 12. Correlation Coefficients and Percentage Distributions among Newlyweds and Prevailing Marriages

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<tbody>
<tr>
<td></td>
<td>Newlyweds</td>
<td>Prevailing marriages</td>
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<tr>
<td><strong>Income Pairings of Spouses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation between husbands’ and wives’ income</td>
<td>0.26</td>
<td>-0.05</td>
</tr>
<tr>
<td>Percentage income hypergamy</td>
<td>73.28</td>
<td>86.46</td>
</tr>
<tr>
<td>Percentage income hypogamy</td>
<td>14.80</td>
<td>6.50</td>
</tr>
<tr>
<td>Percentage income homogamy</td>
<td>11.92</td>
<td>7.04</td>
</tr>
<tr>
<td><strong>Educational Pairings of Spouses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation between husbands’ and wives’ education</td>
<td>0.61</td>
<td>0.61</td>
</tr>
<tr>
<td>Percentage educational hypergamy</td>
<td>21.45</td>
<td>26.49</td>
</tr>
<tr>
<td>Percentage educational hypogamy</td>
<td>16.22</td>
<td>11.25</td>
</tr>
<tr>
<td>Percentage educational homogamy</td>
<td>62.33</td>
<td>62.27</td>
</tr>
</tbody>
</table>

*Note: Only first marriages were included. Sample selection criteria, in terms of age, nativity, and income, were consistent between newlyweds and prevailing marriages. Education has four categories, and income is measured in deciles (as defined in the *Data and Measurement* section in Chapter 2). Data were weighted in 2008–2012. Hypergamy refers to marriages where the husband is more educated or in a higher income decile than the wife. Hypogamy refers to marriages where the wife is more educated or in a higher income decile than the husband. Homogamy refers to marriages where two spouses share the same level of education or income.*