

INTIMATE PARTNER VIOLENCE IN THE GREAT RECESSION

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ABSTRACT

In the United States, the Great Recession has been marked by severe negative shocks to labor market conditions. In this study, we combine longitudinal data from the Fragile Families and Child Wellbeing Study with Bureau of Labor Statistics data on local area unemployment rates to examine the relationship between adverse labor market conditions and intimate partner violence between 1999 and 2010. We find that rapidly worsening labor market conditions are associated with increases in the prevalence of violent/controlling behavior in marriage. These effects are most pronounced among whites and those with at least some post-secondary education. Worsening economic conditions significantly increase the risk that white mothers and more educated mothers will be in violent/controlling marriages rather than high quality marital unions.

INTRODUCTION

The Great Recession, which officially began in 2007 and ended in 2009, has rekindled interest in a question of long standing interest to sociologists: how is the quality of adult romantic relationships shaped by macro-economic conditions? Seminal studies of the Great Depression by Komarovsky (1940), Bakke (1940), Elder (1974), and Liker and Elder (1983) carefully detailed the pernicious effects of unemployment, lost income, and economic hardship on marital conflict and quality. Decades later, in their study of the Iowa Farm Crisis, Conger and his colleagues extended the foundational work of Elder and others by documenting how income loss and economic hardship led to feelings of economic strain and ultimately, marital conflict. Together, these two bodies of work gave rise to the “Family Stress Model,” which maps out the pathways through which economic hardship affects family functioning. The model predicts that economic hardship leads to feelings of economic stress and strain, which, in turn, lead to marital conflict and ultimately to the degradation of parenting and declines in child well-being.

Approximately seventy-five years after the Great Depression and twenty-five years after the Iowa Farm Crisis, we examine the effects of a third economic crisis – the Great Recession – on an extreme measure of marital quality – intimate partner violence. Drawing on five waves of individual-level, longitudinal data from the Fragile Families and Child Wellbeing Study combined with Bureau of Labor Statistics data on local area unemployment rates, we assess how macro-economic conditions, including the dramatic shock of the Great Recession, affect violent and controlling behavior in romantic co-residential unions.

Our analysis follows in the tradition of Elder and Conger in examining how economic recessions shape the quality of romantic unions. However, we significantly advance prior work in three key ways.

First, we adopt a more rigorous approach to causal inference, using exogenous measures of macro-economic conditions to identify the effects of the recession on the quality of romantic unions. This approach improves upon prior work on the effect of individual-level markers of economic hardship on relationship quality that likely suffered from problems of omitted variables bias.

Second, the Great Recession may have affected relationship quality both by directly increasing the incidence of realized economic hardships and more indirectly by creating a climate of economic uncertainty and fear. We allow for these two forces by examining the relationship between intimate partner violence and aggregate levels of unemployment and shocks to unemployment during the Great Recession. These aggregate rates serve to capture both the concentrated effects of individual job loss as well as the more diffuse effects of a climate of economic uncertainty. This approach departs from prior research on relationship quality in the Great Recession and Iowa Farm crisis, which only allowed for the direct effects of individual realized hardship, and from prior work using point-in-time aggregate measures of neighborhood disadvantage during normal business cycles.

Third, we use a population-based sample of couples who lived through the Great Recession. While prior work on the Iowa Farm Crisis and Great Depression used homogenous unrepresentative samples of intact married couples and later research used nationally representative data collected during normal business cycles, our data allow us to model how the effects of recession might affect the population broadly. The use of a broadly representative sample allows us to examine heterogeneity in the effects of the recession by demographic sub-group and by type of romantic union.

We find that the Great Recession and other periods of worsening labor market conditions in the 2000s were associated with increases in the prevalence of violent or controlling behavior in

marriage, but not cohabitation. Black and Hispanic women and less educated women were more likely to experience intimate partner violence in both low and high unemployment environments. The effect of a worsening economy, however, was stronger for white mothers and for mothers with at least some college education. During the Great Recession, the prevalence of partner violence among white and more educated women rose to the level normally experienced by their more disadvantaged counterparts.

In the following sections we review several literatures that are relevant to the question of how adverse economic conditions affect intimate partner violence. We begin by discussing key theoretical perspectives on the link between economic conditions and intimate partner violence. We then turn to a consideration of past empirical research on the economic correlates of intimate partner violence and discuss the limitations of this prior empirical work in light of (1) problems of causal inference, (2) the need to consider both economic hardship and uncertainty effects during recession, and (3) the limited representativeness of samples and the inability to assess heterogeneity in effects.

BACKGROUND

National estimates of the prevalence of intimate partner violence against women are in the range of 10% to 15% annually, with estimates of lifetime prevalence being much higher (Wilt and Olson, 1996; Moracco et al, 2007). Intimate partner violence in families with children poses additional concerns, as children may also be victims of violence, may experience parental neglect, or may suffer trauma from witnessing parental violence and victimization (Nicklas and MacKenzie, 2013; Appel and Holden, 1998).

Theoretical Perspectives on Economic Conditions and Intimate Partner Violence

In the study of intimate partner violence, researchers have developed typologies that distinguish among different patterns of violent/controlling behavior, with the term “situational couple violence” being used to refer to violence triggered by stressful circumstances (Johnson, 2008). Situational couple violence is the most common type of intimate partner violence, and also the type that, in theory, is most sensitive to changing economic circumstances.

Specifically, the stress of economic hardship may increase the incidence of a partner’s violent and controlling behavior. Economic downturns and the experience of economic hardship are stressful for individuals and for couple relationships. Spouses, who might otherwise have kept negative behaviors in check, may buckle under the stress of challenging economic conditions, allowing their violent and controlling behavior to emerge.

In addition to its effect on those who experienced unemployment and economic hardship, the recession may also have increased uncertainty and fear among a broader segment of the population. Theory and laboratory experiments in psychology and behavioral economics advance the idea that even those who have not experienced hardship may be affected by adverse economic conditions because they anticipate unemployment or income loss (Baumister et al, 2007). Caplin and Leahy (2001) describe how feelings of uncertainty and anxiety importantly shape decision-making, and Lowenstein et al (2001) argue that situations of economic uncertainty generate anticipatory emotions that affect behavior. Research also suggests that a loss of control in one domain, such as one’s economic circumstances, may manifest in greater efforts at control over an intimate partner, including through violence (Stets, 1995; but see Umberson et al, 2007). Together, this literature provides a strong rationale for why adverse macro-economic conditions and the uncertainty engendered by poor conditions might affect relationships, not just among those who directly experience job loss, but also among their counterparts in the broader population.

The extent to which recessions affect intimate partner violence via either hardship, and/or uncertainty might also vary across demographic and socio-economic subgroups.

One intuitive assumption is that the recession would have a stronger negative effect on the relationship quality of couples with fewer resources in so far as any negative economic shock is more likely to push them off the (very near) financial “cliff.” Furthermore, racial/ethnic minorities and those with the lowest levels of educational attainment were hardest hit by Great Recession (Hout, Levanon, and Cumberworth, 2011; Hoynes, Miller, and Schaller, 2012).

Alternatively, while the Great Recession seriously disrupted household finances, a large portion of American households were not prospering economically even before the recession. Due to stagnant incomes, the rising insecurity of work, and the loss of blue-collar unionized jobs, many non-white and less-educated households were in precarious economic positions even before the Great Recession (Kalleberg, 2011; McCall and Percheski, 2010). This prior experience with economic adversity might have diminished the effects of recession. Bakke (1940) described a similar dynamic at work during the Great Depression when he noted, “the tendency of unemployment to disorganize family relations is least among those who know what to expect...” (p. 233). Similarly, Liker and Elder (1983) observed that middle class families were especially at risk of deterioration in marital quality during the Depression and that a “protective resource appears to be prior experience with economic hardship... With prior losses in their experience, these couples were undoubtedly less apt to feel traumatized by a lack of financial resources and security” (p. 356).

The recession could also have quite different effects for women in marital and cohabiting unions. For instance, it appears that the quality of cohabitating relationships may be less dependent on the ability of men to fulfill traditional breadwinner roles than for marriages (Brines and Joyner, 1999; Kalmijin et al, 2008; Tach, 2009), perhaps making such unions more resilient to economic stress. Further, marriages are less likely to dissolve than cohabiting unions (Smock, 2000) and the

risk of marital dissolution may actually decline during economic crisis due to the costs associated with divorce (Amato and Bettie, 2010; Schaller, 2012). These relationship-sorting dynamics could serve to trap married women in violent or controlling relationships while cohabiting women dissolved such unions, raising the incidence of violent or controlling marriages but not cohabitations.

Prior Empirical Research

A large body of research on the family stress model has documented a link between economic hardship during recession and marital quality (e.g. Elder, 1974; Liker and Elder, 1983; Conger et al, 1992.). Over the past two decades, the family stress model has been tested (and its findings generally replicated) in other settings in the United States (Conger et al, 1992; Elder et al, 1992; Conger et al, 2002; Gudmunson et al, 2007; Dew, 2007; Conger, 2010) as well as in countries such as Korea (Kwon et al, 2003), Turkey (Aytac and Rankin, 2009) and Finland (Kinnunen and Feldt, 2004).

More recently, research has found that at the individual-level, economic vulnerability, employment instability, and subjective feelings of strain are associated with intimate partner violence (Benson et al, 2003; Fox and Benson, 2006) as are husband's unemployment (Fox et al, 2002), low couple income (Cunradi et al, 2002), and economic hardship (Golden et al, 2013; Hardie and Lucas, 2010).

However, as Conger et al (2010) have recently noted, nearly all of the prior work on economic hardship and marital quality (and we would note, much of the work on intimate partner violence), suffers from serious problems of omitted variable bias. The individual-level measures of strain, unemployment, income, and hardship used in both the studies of the Great Depression and the Iowa Farm Crisis as well as in studies of intimate partner violence during normal business cycles,

are likely to also be associated with a host of other difficult to observe individual-level characteristics that are also associated with low-quality unions and intimate partner violence. Therefore, prior research does not tell us whether economic strain causes intimate partner violence, or whether an omitted variable – such as impulsivity or lack of self-control – is the root cause of both economic strain and intimate partner violence.

These two bodies of literature use individual-level economic characteristics. A small number of studies have attempted instead to estimate the relationship between area-level economic conditions and intimate partner violence. Peterson (2011), for example, finds a very weak relationship between national unemployment rates and individual reports of intimate partner violence victimization using data from 1993-2005. He extrapolates from his estimates to predict that the Great Recession will not increase the rate of intimate partner violence. However, Peterson only examines fluctuations in unemployment between 1993-2005, which were small compared to the rise in unemployment during the Great Recession. The Great Recession was also accompanied by a housing crisis that was absent in the 1993-2005 period.

Although evidence on macro-level unemployment and intimate partner violence is quite limited, a set of studies find evidence for a positive relationship between neighborhood disadvantage and male-to-female intimate partner violence (Benson et al, 2003; Fox and Benson 2006; Golden et al, 2013; O'Campo et al., 1995; Van Wyk et al., 2003). The evidence on neighborhood disadvantage and intimate partner violence comes from analyses of Census data on neighborhoods merged onto micro data from the National Survey of Families and Households, the Fragile Families and Child Wellbeing study, or other sources of individual-level data. These analyses establish an association between neighborhood disadvantage (measured by unemployment rates, poverty, or other indicators) and intimate partner violence.

While these studies of neighborhood disadvantage have the virtue of combining individual-level measures of intimate partner violence with aggregate information on economic conditions that might be exogenous to unobserved individual-level characteristics, these studies are generally cross-sectional with either the individual and aggregate measures or just the aggregate measures taken at a single point in time, raising the threat of omitted variables bias at the neighborhood-level. These studies, therefore, do not investigate how changes *over time* in economic conditions affect relationships. For these reasons, we lack convincing tests in the literature of the effect of economic hardship on intimate partner violence.

Additionally, studies of economic conditions and intimate partner violence have not looked carefully at the role of economic uncertainty. Individual-level studies of the economic correlates of intimate partner violence generally measure realized distress through individual unemployment or hardship but do not capture potential effects on the broader population that may experience fear or uncertainty about their financial future. Area-level studies, such as those by Peterson (2012) and Fox and colleagues do use aggregate measures which could potentially capture both hardship and uncertainty effects. However, these studies either lack the variation in economic conditions induced by times of pronounced recession, measure neighborhood disadvantage rather than economic conditions, or cannot assess the role of shocks to the local economy since they employ point-in-time measures of neighborhood conditions.

Although research has not focused specifically on uncertainty and intimate partner violence, there is some evidence that uncertainty influences other family processes. Scholars have attributed some of the decline in fertility in post-soviet states to uncertainty about the economic future (Sobotka et al, 2011), and uncertainty about career entry in Europe (Blossfeld et al, 2005) and the United States (Oppenheimer, Kalmijn, and Lim, 1997) appears to delay marriage. Research has also found that economic uncertainty, measured by individual perceptions of the risk of job loss, is

associated with lower relationship satisfaction (Voydanoff, 1990). If economic uncertainty is linked to poorer relationship quality, it follows that the uncertainty generated by the Great Recession may have led to a rise in intimate partner violence.

These previous studies described above tend to make an important empirical tradeoff between representativeness and attention to economic recession. In studies focused on the Great Depression or Iowa Farm Crisis, the macroeconomic shocks are major, but the study samples are confined to specific geographic areas (such as rural Iowa counties in the case of Conger's studies), homogenous populations (such as the nearly all white samples used in Liker and Elder's (1983) seminal work), and to intact married couples. The result is that these studies of periods of recession lack broad external validity, cannot examine heterogeneity in response to economic conditions, and do not account for fluidity in the pool of married relationships, let alone of cohabiters.

A second set of studies uses broadly representative samples, but the macro-economic fluctuations in the time periods covered are minor, as compared with those that occurred during the Great Recession (e.g. Peterson, 2011; Benson et al, 2003; Hardie and Lucas, 2013).

Further, while this prior individual-level research on non-recessionary periods has examined differences in the risk of intimate partner violence by race (Golden et al, 2013; Fox et al, 2002; Benson et al, 2003), education (Fox et al, 2002; Peterson, 2011; Benson et al, 2003), and relationship type (Brown and Bulanda, 2008; Kenney and McLanahan 2006; Stets and Straus, 1990), very little recent empirical work attempts to estimate how the effects of economic conditions might vary depending on these characteristics.

Two notable exceptions find that the effects of individual-level economic distress are the same for married and cohabiting couples (Hardie and Lucas, 2010) and that household income is more strongly associated with intimate partner violence among black and Hispanic couples than among whites (Cunradi et al, 2002). However, research on neighborhood disadvantage and intimate

partner violence finds some evidence that the relationship between neighborhood disadvantage and intimate partner violence is stronger for more socioeconomically advantaged groups (Fox and Benson, 2006, though see Cunradi et al, 2000).

Intimate Partner Violence in the Great Recession

No research to date has examined the effects of the Great Recession on intimate partner violence. Further, as discussed above, prior research on the broader topic of economic conditions and intimate partner violence suffers from serious empirical problems.

We draw on rich longitudinal data from the Fragile Families and Child Wellbeing Study to investigate the effects of the Great Recession on intimate partner violence. We merge this individual-level data with exogenous MSA-level information on unemployment. We use this data, covering the years leading up to and including the Great Recession, to estimate how exposure to poor economic conditions shapes the incidence of intimate partner violence. This approach provides us with stronger causal estimates than found in prior work.

Our approach also allows us to consider the twinned effects of economic hardship and of economic uncertainty on intimate partner violence. By using measures aggregate measures of levels of unemployment along with measures of changes or shocks in unemployment we capture the combined effects of unemployment hardship and uncertainty.

A third virtue of our approach is that the Fragile Families data are representative of a known population and include a heterogeneous set of respondents with varied race/ethnicities, educational attainment, and union status. These sample characteristics provide our results with broader external validity, allow us to account for fluidity in the pool of married and cohabiting couples, and give us the ability to examine heterogeneity in the effects of economic conditions on intimate partner violence during the recession.

DATA AND METHODS

The Fragile Families and Child Wellbeing Study (FFS) is a population-based, longitudinal study of births that occurred in large American cities between 1998 and 2000. The FFS interviewed the parents of 4,898 focal children at the time of the child's birth and then followed these families over time, seeking to re-interview the mother and father of the focal child at 1 year, 3 years, 5 years, and 9 years after the birth. (Reichman, Teitler, Garfinkel, and McLanahan, 2001).

The FFS is uniquely well suited to estimating the effect of the Recession on intimate partner violence.¹ The design of the sample and the fielding schedule of the survey create substantial temporal and spatial heterogeneity in the economic conditions to which respondents were exposed. Respondents resided in twenty American cities and were interviewed five times between 1998 and 2009. Importantly, the fifth and most recent wave of data collection was conducted between 2007 and 2009, coinciding very closely with the years of the Great Recession (lasting from December of 2007 – June of 2009 according to the NBER). Rather than simply inferring recession effects from a relationship between economic conditions and family dynamics in a pre-recessionary period, here we directly observe behavior before and during the Great Recession.

The FFS also contains detailed measures of intimate partner violence that were collected consistently from the 1-year follow-up through the 9-year follow-up. This measure includes information on violent behavior as well as information on controlling behavior.

Much of the previous work on relationship quality during recessions has been based on small samples that are demographically and geographically homogenous (e.g. Elder, 1973; Liker and Elder, 1983; Conger et al, 1990). The FFS is representative of a cohort of births in large American cities and contains an over-sample of non-marital births. The study design led to a large sample of low income and non-white parents, which allows us to consider the effects of the Great Recession on the population as a whole and to investigate variation in those effects by race/ethnicity,

education, and marital status. We construct a person-wave file based on female respondents' reports at the 1-year, 3-year, 5-year, and 9-year follow-up surveys. There were 4,898 female respondents at baseline. However, there was some attrition from the survey such that 4,364 mothers were interviewed at the 1-year, 4,231 at the 3-year, 4,139 at the 5-year, and 3,515 at the 9-year surveys.. In total then, there were 16,249 person-wave observations available. We do not have any missing data on our main predictor variable, unemployment rate, because it is based on administrative data. There is very little missing information on relationship quality and on the internally constructed measures of relationship status. Deleting observations with missing data on these items used to construct the dependent variable produces a final analysis sample of 4,688 respondents and 16,115 person-wave observations.

We focus on a longer period of time (1999- 2010) than the official period of recession (2007-2009). We do so in order to exploit the greater variation in economic conditions that comes with including pre-recession years and to increase power and precision. However, we speak directly to the question of recession effects, as distinct from general business cycle effects, by using the parameters from our model to predict outcomes based on the actual economic conditions observed during the Great Recession. We also include a model specification that allows for economic conditions to have non-linear effects on intimate partner violence. This modeling choice allows us to capture the extent to which the dramatic negative shocks seen in select cities in 2002 and in all cities during the Great Recession had different effects from more modest economic fluctuations.

Intimate Partner Violence

Our dependent variable is constructed from six items designed to measure whether the mothers of the focal child were subject to any violent or controlling behavior by their current co-residential romantic partners. Respondents were asked to “think about how [husband/partner] behaves

towards you. For each statement I read, please tell me how often he behaves this way” (Often, Sometimes, or Never):

- (1) He tries to keep you from seeing or talking with your friends or family
- (2) He tries to prevent you from going to work or school
- (3) He withholds money, makes you ask for money, or takes your money
- (4) He slaps or kicks you
- (5) He hits you with a fist or an object that could hurt you
- (6) He tries to make you have sex or do sexual things you don’t want to do

Some of these items are drawn from the broader set of questions that make up the Conflict Tactics Scales (CTS), which are well validated and have been employed widely in research on intimate partner violence (Straus, 1979; Straus, Gelles, and Steinmetz, 2009 [1980]). Other items are drawn those derived by Lloyd (1997) from her interviews with domestic violence victims. These items have been used in similar abbreviated form in prior research (e.g. Golden et al, 2013; Nicklas and Mackenzie, 2013; Isacco, Garfield, and Rogers, 2010; Charles and Perreira, 2007).

There are two key advantages to this survey-based approach to measuring intimate partner violence. First, rather than focus only on physical aggression, these items also include coercive controlling behavior, which has ill effects of its own and is also a frequent precursor to physical violence (O’Leary, 1999). Second, these self-reported measures may be susceptible to under-reporting. However, we expect such bias is likely to be far less extreme than administrative measures of intimate partner violence such as arrests or calls to police (Rennison, et al, 2000).

These questions were asked at each follow-up survey and for each wave, we create a single summary dichotomous measure based on these six items that is equal to one if the respondent reported that her husband or co-residential partner sometimes or often engaged in one or more of these activities. Women who reported that their husbands or partners never engaged in any of these activities are coded as zeroes.

Used alone, this measure would lead to the exclusion of respondents not in romantic relationships – a possible source of bias (Glenn, 1990) given that intimate partner violence is

associated with union dissolution (Bowlus and Seitz, 2006; Kingston-Riechers, 2001). Further, there is good reason to expect that the effects of the recession might differ between married and cohabiting relationships and that the dynamics of how recession affects the dissolution of marriages and cohabitations could be quite different, suggesting that these groups of respondents should be considered separately.

Therefore, we draw on data on female respondents' relationship status at the time of the interview to construct a more complex measure of intimate partner violence that does not exclude women who are not in a relationship. Respondents are coded as either (1) not being in a co-residential relationship, (2) being in a violent or controlling marriage, (3) being in a non-violent/non-controlling marriage, (4) being in a violent or controlling cohabiting union, or (5) being in a non-violent/non-controlling cohabiting union.

Economic Conditions

Economic conditions varied considerably over the twenty cities in which FFS respondents resided and over the period from 1999, when the earliest 1-year follow-up interviews were conducted, through 2010, when the last 9-year follow-up interviews were completed. We exploit this spatial and temporal variation in economic conditions by using restricted geographic information on respondents' place of residence at baseline to merge measures of CBSA unemployment rates to each respondent record.

There are key advantages to using these area-level rates as our primary explanatory variables rather than relying on the individual-level measures of unemployment available in the micro-data. Individual-level measures of economic distress, such as experience with unemployment, will only capture the more concentrated effect of realized hardship. Aggregate measures such as the

unemployment rate have the virtue of measuring both the probability that a given individual is unemployed as well as any broader effects that a high-unemployment environment may have.

Additionally, using area-level measures of unemployment mitigates two empirical problems that bedevil estimates based on individual-level measures of economic hardship. First, there is a serious risk of omitted variables bias in the relationship between individual hardship and intimate partner violence; men who are likely to engage in violent or controlling behavior may also have difficult-to-measure traits that reduce employability and increase hardship. In contrast, area-level measures of unemployment are plausibly exogenous to any such individual characteristics. Second, individual-level economic hardship may cause IPV, but it is also the case that IPV may cause individual-level economic hardship. This link is well established for women (Johnson and Ferraro, 2004; Lloyd 1997), but could also occur for men if committing IPV led to the disruption of economic routines due to involvement in the criminal justice system. In contrast, it is implausible to assert that the individual-level incidence of IPV causes area-level unemployment rates, effectively surmounting this problem of reverse-causality.

We measure the unemployment rate using data from the Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS). The BLS LAUS data is the best available information on sub-national unemployment rates. BLS LAUS unemployment rates are estimated from models using data from the Current Population Survey, the Current Employment Statistics (CES) program, and state unemployment insurance systems. Here, the unemployment rate is defined as the number of persons without employment in the reference week who had attempted to find employment during the four previous weeks divided by the number of persons working or unemployed and looking for work. We employ the twelve-month lagged measure of MSA unemployment. This captures the prevailing level of unemployment in the Fragile Families cities and most closely proxies for economic hardship within these cities.

Empirically measuring uncertainty has proved somewhat difficult. However, one fruitful strategy is based on recognizing that individuals are influenced not only by the level but also by changes in economic attributes (Kahneman, Knetsch, and Thaler, 1991). High levels of unemployment are good proxies for economic hardship in the population. But, individuals also become psychologically accustomed to prevailing conditions (Frederick and Lowenstein, 1999). With time, a high level of unemployment may create perceptions of stable rather than uncertain economic conditions. Consequently, measuring changes in economic or other aggregate conditions may capture the uncertainty felt by individuals in dynamic environments. This approach has been usefully employed in research on the effects of neighborhood change on racially motivated crime (Green et al, 1998) as well as in work on the effects of changes in unemployment on fertility (Sobotka et al, 2011).

We construct a measure of the twelve-month percentage change in unemployment in respondents' CBSAs where positive values indicate worsening unemployment over the year prior to interview. This operationalizes the idea that changes, perhaps more than levels, in economic conditions may have important behavioral effects by influencing individuals' sense of economic uncertainty and fear.

Race/Ethnicity and Education

In addition to the measures of intimate partner violence and relationship status, we make use of several other individual level variables in our analysis. Respondents' education is measured at baseline, and respondents are categorized as having less than a high-school degree, a high school degree, some college, or a college degree. Respondents are also coded as being either non-Hispanic White, non-Hispanic Black, Hispanic, or of another race/ethnicity. We omit the relatively small

number of respondents (4% of the sample) in this final category from analyses that make use of the race/ethnicity data.

Analytic Approach

We use multinomial logistic regression to estimate the relationship between CBSA unemployment and percent change in unemployment and our five-category outcome of relationship status/intimate partner violence. To take advantage of all of the data available, we pool Waves 2 through 5 of the survey, the four waves in which intimate partner violence data were collected, and analyze person-waves. Because each individual can appear in the data set up to 4 times, we adjust for the non-independence of observations by using cluster-robust standard errors implemented with the Stata command `vce(cluster clustervar)`. Our models include fixed effects for city and for interview wave. The parameters of interest are the effect of unemployment levels and the effect of changes in unemployment levels on the odds of not being in a romantic co-residential union, of being in a violent/controlling marriage, of being in a non-violent/non-controlling cohabiting union, or of being in a violent/controlling cohabitation, relative to being in a non-violent/non-controlling marriage. We present odds ratios as well as predicted probabilities.

The area-level measures of unemployment and unemployment change should be exogenous to any individual level characteristics. Nevertheless, our models control for race/ethnicity education, marital status at the birth of the focal child and the focal child's age in months at each follow-up interview. The inclusion of these variables does not affect the relationship of interest: that of the macro-economy and relationship status/intimate partner violence.

On average, unemployment rates increased over time between 1999 and 2010. This relationship is not linear as there were pre-Great Recession increases in unemployment in 2001-2002, followed by declines. Further, the trends in unemployment differ considerably across cities.

However, to the extent that there is time dependence in unemployment over this period, we need to consider other time-varying characteristics that may be correlated with time (and therefore the macro-economy) and also with relationship status and quality. One such factor is duration in current relationship status, which we would expect to increase with time and perhaps shape current relationship status and quality. We measure duration in current relationship status by using data on the year and month in which mothers' current romantic co-residential relationships were formed and dissolved, allowing us to attach a measure of months in current relationship state (cohabiting, married, no romantic co-residential union) at the time of each interview.

A second possible confounding factor is household composition. If mothers are more likely to have additional children or young children in the household over time, and if these factors also shape relationship status and quality (Sorenson et al, 1996), then such aspects of household composition could confound the relationship with a worsening unemployment rate. We draw on data from the household roster, completed at each interview, to construct a measure of the number of children under age 2 in the household, the age of the youngest child in the household, and the number of minors in the household.

A related issue concerns selective migration. Some respondents may have moved in response to high levels of unemployment in their baseline city and this selective migration on economic conditions could bias our results. In our main models we circumvent this problem by assigning every respondent the economic conditions experienced in their baseline city. But, we also test the robustness of our results to excluding respondent-wave observations made when respondents were not residing in their baseline city (7 percent).

Our preferred measure of economic conditions is a linear term for unemployment level and a linear term for percent change in unemployment. We examine the robustness of the results to using a categorical measure of unemployment change and to using a quadratic term.

Our main models estimate the relationship between unemployment and the likelihood that respondents are in each of our five relationship status/quality categories. However, prior literature suggests that this relationship might vary importantly depending on respondents' race/ethnicity and education. To test this prediction, we re-estimate our multinomial logistic regression models including an interaction between unemployment and race/ethnicity and between unemployment and baseline education.

RESULTS

Descriptive Results

Figure 1 displays the unemployment rate for the 20 Fragile Families cities from 1998 through 2010 as well as the trend in percentage change in unemployment for the 20 cities over the same time period. The figure makes clear the considerable spatial and temporal variation in unemployment rates.

The Fragile Families survey waves were staggered by city. In the first set of cities, the five survey waves were administered in 1998, 1999, 2001, 2003, and 2008. In the last set of cities, survey waves were administered in 2000, 2001, 2003, 2005, and 2009-2010. Within each city, the timing of each interview varied across respondent by several months.

The staggered timing of interviews allowed for a great deal of variation in the unemployment level and the change in the unemployment rate across the sample respondents. In all cities, the unemployment rate was relatively low between 1998 and 2000 at the time of the focal child's birth when the first survey wave was administered. In the first set of cities, the economy continued to be strong at the time of the second wave of data collection (1999). In contrast, in many of the later cities, unemployment rates had increased markedly by the time of the second interview in 2001. In most cities, the unemployment rate worsened between the second and third interviews. In the early

cities, the economy worsened between Wave 3 and 4, whereas in the later cities it improved. In the early cities, Wave 5 coincided with the beginnings of the Great Recession; in the later cities, Wave 5 took place a year or more after the onset of the Great Recession.

Table 1 displays descriptive information on our five-category dependent variable. On average and across all survey waves, 37 percent of mothers were not in a romantic co-residential relationship, 34 percent were married, and 28 percent were in a cohabiting relationship. A sizeable minority of married and cohabiting mothers were in violent/controlling relationships. Among married mothers, 15% ($5\%/(5\%+29\%)$) reported that their husband engaged in physically violent or controlling behavior across survey waves. Among cohabiting mothers, 18% ($5\%/(5\%+23\%)$) reported that their cohabiting partner was violent or controlling.

Main Effects

To address the question of how the quality of adult romantic relationships is shaped by macro-economic conditions, we estimate multinomial logistic regressions of our five-category relationship status and quality outcome on unemployment rates and percentage changes in unemployment rates. The results are reported in Table 2 below. The table shows the relationship between unemployment and 5 categories of relationship status/quality. We use non-violent/non-controlling marriage, referred to as “high quality marriage,” as the reference category because we view this category as one end of a relationship continuum and as a near-universal aspiration in this population (Edin and Kefalas, 2005). Model 1 uses the percent change in unemployment to measure macro-economic conditions, Model 2 uses the level of unemployment (lagged by one year), and Model 3 includes both measures of the macro-economic conditions.

As shown in Table 2, changes in the unemployment rate are related to the quality of marital and cohabiting relationships, though in quite different ways. Model 1 shows that an increase in the

local unemployment rate is associated with a significant increase in the risk of being in violent/controlling marriage relative to a high quality marriage (RRR = 1.47, $p < 0.05$). This result is consistent with the idea that economic hardship and/or uncertainty leads to relationship conflict, as well as with the idea that recession-induced delays in divorce could trap some women in violent/controlling relationships.

In contrast, worsening unemployment is not associated with the risk of being in a violent/controlling cohabiting relationship but is associated with an increase in non-violent/controlling cohabiting relationships (relative to a high quality marriage). Why would this be? Cohabiting relationships involve fewer joint investments and are easier to dissolve. The dynamics that lead married couples to delay divorce during economic downturns may not apply to more tenuous cohabiting relationships. If low quality cohabiting relationships were more likely to dissolve in the face of poor economic conditions, the overall quality of cohabiting relationship would increase. Further, if couples in high quality cohabiting unions were more likely to delay marriage during hard times, the overall quality of cohabiting unions would also improve.

Interestingly, Table 2 shows that while the change in the unemployment rate has a significant effect on relationship status/quality, the level of unemployment does not affect relationship status/quality. In Model 2, the level of unemployment is not significantly related to relationship status or quality, and the odds ratios on lagged unemployment rates are close to 1. In Model 3, including the change in the unemployment rates along with the level of unemployment rates does not change the pattern of results: changes in unemployment rates remain significantly related to increases in violent/controlling marriage and to increases in non-violent/controlling cohabiting relationships. These results are consistent with the idea that individuals adapt to relatively higher or lower levels of local unemployment but that large changes in economic conditions have more of an impact on relationship behavior.

To give a better sense of the magnitude of the relationship between worsening unemployment rates and violent/controlling marriage, Figure 2 plots the predicted shares of married mothers in violent/controlling marriages at different levels of change in the unemployment rate.³ When the unemployment rate is stable (0% change), just under 15% of married mothers report that their husband engaged in violent or controlling behavior. When the unemployment rate had doubled (100% change), as we saw in the Great Recession, closer to 20% of married mothers reported being in a violent/controlling marriage.

Figure 3 demonstrates that the preceding results are robust to a variety of model specifications. Model 1 displays point estimates and confidence intervals from Table 2, Model 3 (our preferred specification). Model 2 controls for mothers' race, education, marital status at baseline, and focal child's age at interview. Model 3 controls for the length of time that mothers were in their current relationship status at interview and several controls for the presence of children in the household. Model 4 omits mothers' who moved outside of their baseline state of residence. The point estimates and confidence intervals change only slightly across these four model specifications, and the overall pattern of results remains unchanged.

In the preceding results, the percent change in unemployment rates is treated as a continuous variable. To test the assumption of linearity in the relationship between changing unemployment and relationship status/quality, Table 3 presents results from a categorical specification of change in the unemployment rate. Here negative changes are distinguished from positive changes, and small positive changes are distinguished from large positive changes. Table 3 suggests that relative to large declines in unemployment (omitted category), large increases in the unemployment rate, as seen in select cities in 2002 and in all cities during the Great Recession period, affect relationship behavior whereas smaller changes do not. An increase in unemployment of 25% or more is associated with being in a violent/controlling marriage and with being in a non-

violent/controlling cohabiting relationship, as shown in earlier results. In addition, a large increase in the unemployment rate is (weakly) associated with being in no relationship.²

Interactions with Education and with Race/Ethnicity

Table 4 shows that mothers' relationship status and quality varies a great deal across race/ethnic and education subgroups, with the largest difference being whether or not a mother is in a co-residential relationship. Approximately half of Black mothers are not in a relationship, compared with one-third of Hispanic mothers, and one-quarter of White mothers. Among married mothers, Black and Hispanic mothers are somewhat more likely to report being in a violent/controlling marriage compared with White mothers. The pattern is different in cohabiting relationships. Among cohabiting mothers, White and Hispanic mothers are somewhat more likely than Black mothers to report that their partner is violent or controlling.

Mothers with a college degree are far more likely to be married than their counterparts with less education. Only 13% of college-educated mothers are not in a relationship compared with 37-42% of mothers with less than a college degree. Among married mothers, the percent reporting violent/controlling behavior in their marriage is 22% among the less than high school group, 16% and 15% among the middle education groups, and 6% among the college-educated group. Among cohabiting mothers, we see the highest levels of violent/controlling behavior among the less than high school group.

Table 5 interacts the change in the unemployment rate with race/ethnic group (Model 1) and education group (Model 2) to test whether the relationship between the economy and relationship status/quality varies across these groups. Model 1 shows that the significant associations between worsening economic conditions and relationship status/quality are concentrated among White mothers and smaller or null for Black and Hispanic mothers. For White mothers, an increase in

local unemployment is associated with being in no relationship, being in a violent/controlling marriage, or being in a non-violent cohabiting relationship, relative to being in non-violent/controlling marriage (represented by the main effect of percent change unemployment in Model 1). For Black or Hispanic mothers, these relationships are closer to zero and insignificant (represented by the product of the main effect on change in unemployment and the interaction of change in unemployment and Black or Hispanic). Testing the joint significance of the main effect of change in the unemployment rate with the race/ethnicity interaction terms reveals a significant effect of unemployment change for white mothers ($p < 0.001$) on the relative risk of being in a violent/controlling marriage versus a high-quality marriage, but not for black or Hispanic mothers. The effect for whites is also significantly different from that for their black or Hispanic counterparts ($p < 0.05$).

Model 2 shows that worsening economic conditions affect the relationship status/quality of more educated mothers but not of less educated mothers. For college-educated mothers, an increase in local unemployment is associated with being in a violent/controlling marriage or a non-violent/controlling cohabiting relationship relative to being in a non-violent controlling marriage (represented by the main effect of percent change unemployment in Model 2) (RRR = 2.12, $p < 0.05$). The insignificant and small term (RRR = 0.93) on the interaction between percent change in unemployment and post-secondary education (some college or technical school) suggests that the increase in violent/controlling marriage is similar for mothers with some post-secondary education. But for mothers with less than a high school degree and for mothers with just a high school degree, worsening unemployment does not increase the chances of being in a violent/controlling marriage. For these women, the interaction between percent change in unemployment and education is significant and negative. The effect for women with a college degree is significantly different from the effect for women with less than high school or a high school diploma only as is the effect for

women with some post-secondary education against women with less than high school or a high school diploma only.

Figures 4 and 5 plot the share of marriages that are violent or controlling by the percent change in the unemployment rate for our three race/ethnic groups and our four education groups, respectively. Figure 4 shows that, on average, violent and controlling behavior in marriage is more common among Black or Hispanic mothers, as compared with White mothers, when economic conditions are stable, whereas deteriorating conditions are associated with a convergence across race/ethnic groups. Under Great Recession conditions when unemployment rates doubled, the share of marriages predicted to involve violent or controlling behavior is about 20% for Hispanic and White mothers and around 15% for Black mothers. Our model estimates suggest that economic shocks have little effect on violent/controlling marriage for Black mothers.

Figure 5 shows an inverse relationship between mothers' education and violent/controlling marriage during stable economic conditions. Our model estimates suggest that a rapid deterioration in economic conditions is associated with a rise in violent/controlling marriage for mothers with some college or a college degree but not mothers with less education. As a result, among college educated and high school educated mothers, the predicted share of marriages that are violent or controlling is just over 15%; and among mothers with some college or less than a high school degree, it is 22% or 23%.

DISCUSSION

A long tradition of sociological research dating back to the Great Depression has shown that times of economic upheaval are also times of family upheaval. In this paper we extend this literature by examining the effects of the Great Recession on intimate partner violence. Our research provides a broad view of how the economy affects the family setting – in structure and quality – of a

representative sample of children living in urban settings. Using data from the Fragile Families and Child Wellbeing study, we also fill several other important substantive and methodological gaps in the prior literature.

Our analytical approach, using city-level unemployment rates that increased rapidly in the Great Recession and varied considerably by time and place allows for stronger causal inference about the effects of the recession on relationship status and quality than has been possible in most prior work. This approach also permits us to consider the twinned effects of direct economic hardship and of economic uncertainty on relationship quality.

The bulk of prior research on economic downturns and relationships has focused on the stability and quality of marriage. During the Great Depression the focus on marriage made sense. In the early twenty first century, however, when 40 percent of children are born outside of marriage and cohabitation is a rapidly growing phenomenon, there is a need for research that includes single and cohabiting parents, not just married parents. Our work uses the rich information on relationship status and quality in the Fragile Families Study to consider the dynamics of both marriage and cohabitation. Further, while prior research in this area has been confined to small and demographically homogenous samples, our data include a broadly representative sample of families and allow for an examination of heterogeneity in recession effects by socio-economic status.

We find that worsening economic conditions are associated with parents being in a violent or controlling marriage relative to a high quality marriage. Under stable economic conditions, 15% of married mothers report violent or controlling behavior – in line with prevalence estimates from prior research. Under the rapidly deteriorating economic conditions of the Great Recession, that percentage increases to 20% (a 33% increase).

On the more positive side, a worsening of the economy is associated with declines in violent and controlling behavior in cohabiting relationships. While a rapid deterioration in the local

economy does not affect the proportion of children living with cohabiting parents, it does reduce the proportion of children whose mothers are victims of violent or controlling behavior. We suspect that the improvement in conditions within cohabiting relationships reflects changes in the composition of the cohabiting couple population. Cohabiting relationships are relatively short-lived and fluid. Therefore, rapid changes in the economy may lead many cohabiting relationships to dissolve and many others to form, as individual circumstances dictate. In particular, poor economic conditions may lead some high quality cohabiting couples to remain in a holding pattern instead of transitioning to marriage. If the latter were true, the overall quality of cohabiting unions would increase.

What should we make of the finding that changes in economic conditions, as measured by rising unemployment, have a much stronger impact on family functioning than high levels of unemployment per se? Several pathways may contribute to this relationship. Most obviously, and the focus of prior research, increases in unemployment rates mean that more individuals are thrown out of work, and this individual-level experience is likely to be a relationship stressor. However, and importantly, our findings suggest that these sharp shocks to unemployment may capture feelings of economic uncertainty experienced when the economy weakens, such as fearing job loss or feeling more insecure. More research is needed to sort out these different mechanisms and determine their relative importance.

Prior research on the social effects of recessions has struggled to distinguish between the unique effects of recessions and the effects of usual business cycles (Suhrcke and Stuckler, 2012). Our work speaks to this issue by showing that increases in intimate partner violence were concentrated among couples who experienced large increases in unemployment (greater than 25%) which were mostly observed during the period of the Great Recession. These findings indicate that recessions are different and more damaging than the fluctuation generated by normal business

cycles. This finding is consistent with the idea that uncertainty generated by larger-than-average economic changes plays an important role in explaining the link between macro-economic conditions and family functioning.

The economic impact of the Great Recession was far reaching. Between 2007 and 2009, unemployment rates doubled across race/ethnic and education subgroups. For Whites and college-educated individuals, unemployment rates doubled from low (2-4%) to moderate (4-8%) levels. For Blacks, Hispanics, and less educated groups, unemployment rates doubled from moderate (6-8%) to high (12-15%) levels. Although unemployment rates reached higher levels for less educated and race/ethnic minority groups, the magnitude of the percent changes – an indicator of the shock of the downturn – was very similar across groups.

Although the unemployment shock of the recession was similar across race/ethnic and education groups, the relationship changes associated with the recession were not. In particular, the relationship status and quality of Blacks, Hispanics, and less educated parents did not change during the recession. Instead, the rise in violent/controlling marriages and the decline in violent/controlling cohabiting relationships were concentrated among White and more educated parents. While this result may seem counterintuitive, it is not without precedent. Early research on the Great Depression argued that prior experience with economic hardship and spells of unemployment were protective factors. As compared with their more advantaged counterparts, individuals who had experience unemployment in the past were better able to adapt and their relationships were less disrupted by the hardships created by the Great Depression.

Our study has several limitations that should be taken into account. First, while our data allow us to include cohabiting and well as marital unions, they do not include non-parents or families living outside of urban areas and thus cannot be generalized to these other groups. Second, while our data cover the recession period and provide some early evidence of its effects on family

functioning, a full assessment of the Great Recession will require a longer follow-up period. Third, though our macro measures of economic conditions have the advantage of capturing the sum total of many different pathways through which a bad economy may affect parent relationships, they do not allow us to identify the exact pathways through which worsening unemployment led to increases in intimate partner violence in marriage, or protected against violence in cohabiting relationships. A fruitful direction for future research is tackling this question of whether the social demographic consequences of the recession reflect the responses of those who directly experience economic hardship, those who experience economic uncertainty, or those who are negatively affected by experiencing limited opportunities for wage growth or promotion with current employers, limited opportunities for job mobility, wealth losses, or furloughs and underemployment.

By many measures, the recession has hit vulnerable groups the hardest. The overall levels of unemployment rose to above 12% for Blacks, Hispanics, and those with less than a high school education. We find a hint of a silver lining for these groups. Whites and more educated groups experienced an increase in violent/controlling behavior in marriage, whereas Blacks, Hispanics, and less educated groups did not. This pattern of findings aligns with a literature on the effective adaptive strategies and resilience of ostensibly disadvantaged families.

ENDNOTES

1. Prior research on economic conditions and intimate partner violence has often made use of the National Survey of Families and Households (NSFH) or the Project on Human Development in Chicago Neighborhoods (PHDCN). The former was last fielded in 2001-2003 and the latter in 2000-2001; neither can be used to directly assess the effects of the Great Recession. Other studies, such as the General Social Survey (GSS), which was fielded during the Great Recession, do not measure intimate partner violence. Three surveys are, however, well-suited to examining the effect of the Great Recession on intimate partner violence. The Fragile Families Study, the National Longitudinal Survey of Youth-97, and National Longitudinal Study of Adolescent Health conducted interviews during the Great Recession and collected information on intimate partner violence in cohabiting and marital unions. However, the Add Health and the NLSY-97 studies are limited by their cohort design, only including young adults age 24-28 (NLSY-97) or 24-32 (Ad Health) at the time of the 2008 interviews in their samples. In contrast, the FFS sample consists of parents of a birth cohort, and captures a wide range of parental ages. Further, the Fragile Families sample focus on parents adds to the social significance of the results because children are directly affected.

2. The predicted share of married mothers in violent/controlling marriages is taken by generating predicted probabilities of mothers being in high quality marriages and the predicted probability of mothers being in violent/controlling marriages, each at each level of unemployment change and then calculating the $(\text{predicted probability in violent/controlling}) / (\text{predicted probability in high quality} + \text{predicted probability in violent/controlling})$.

3. The Great Recession was marked not only by unemployment, but also by foreclosure and low consumer confidence. Recent work on the Recession has tended to focus on unemployment, but

other indicators, particular foreclosure, have also been examined (e.g. Cohen, 2012; Pilkauskas, Currie, and Garfinkel, 2012). We draw on data from the Mortgage Banker's Association National Delinquency Survey to construct state-level measures of the percentage of residential mortgages in foreclosure and of the 1-year percentage change in the share of such mortgages in foreclosure. We also construct similar level and change variables using national-level data on consumer confidence from the University of Michigan's Consumer Sentiment Index. We enter these four additional predictors along with our MSA-level measures of unemployment and re-estimate the multinomial logistic regression model. The coefficients on unemployment are not significantly affected. Both declining and low-levels of consumer confidence are associated with an increased risk of being in no relationship relative to a high quality marriage, but these indicators are otherwise not significantly linked to relationship status/quality. We note that the comparability of these measures is limited in so far as foreclosure is measured only at the state level and confidence at the national level. Unfortunately, no comparable MSA-level data on foreclosures or confidence exists over the 1999-2010 period examined here.

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TABLES

Table 1. Relationship Status and Quality of Mothers at Interview, Pooled Waves 2-5

	Obs	Percent
No Relationship	6,023	37
Violent/Controlling Marriage	828	5
Non-Violent/Controlling Marriage	4,725	29
Percent of Marriages that are Violent/Controlling		15
Violent/Controlling Cohabitation	836	5
Non-Violent/Controlling Cohabitation	3803	23
Percent of Cohabitations that are Violent/Controlling		18

Table 2. Unemployment and Relationship Status/Quality (RRRS from Multinomial Logistic Regressions, City and Wave Fixed Effects)

	M1	M2	M3
<i>High Quality Marriage (Reference)</i>	--	--	--
<i>Low Quality Marriage</i>			
1 Year Percent Change UR	1.47*		1.54*
12 Month Lagged UR		1.00	1.03
<i>High Quality Cohabitation</i>			
1 Year Percent Change UR	1.21+		1.27*
12 Month Lagged UR		1.01	1.03
<i>Low Quality Cohabitation</i>			
1 Year Percent Change UR	1.01		1.02
12 Month Lagged UR		1.01	1.01
<i>No Relationship</i>			
1 Year Percent Change UR	1.09		1.15
12 Month Lagged UR		1.02	1.03
N	16115	16115	16115

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 3. Unemployment and Relationship Status/Quality. Alternative Specifications (RRRs from Multinomial Logistic Regressions, City and Wave Fixed Effects)

	M1
<i>High Quality Marriage (Reference)</i>	--
<i>Low Quality Marriage</i>	
1 Year Percent Change UR < -10%	--
1 Year Percent Change UR -10% to 0%	1.02
1 Year Percent Change UR 0% to 8%	1.11
1 Year Percent Change UR 8% to 25%	1.04
1 Year Percent Change UR > 25%	1.45*
12 Month Lagged UR	1.02
<i>High Quality Cohabitation</i>	
1 Year Percent Change UR < -10%	--
1 Year Percent Change UR -10% to 0%	0.93
1 Year Percent Change UR 0% to 8%	1.00
1 Year Percent Change UR 8% to 25%	1.00
1 Year Percent Change UR > 25%	1.24*
12 Month Lagged UR	1.03
<i>Low Quality Cohabitation</i>	
1 Year Percent Change UR < -10%	--
1 Year Percent Change UR -10% to 0%	0.89
1 Year Percent Change UR 0% to 8%	0.87
1 Year Percent Change UR 8% to 25%	0.86
1 Year Percent Change UR > 25%	0.96
12 Month Lagged UR	1.01
<i>No Relationship</i>	
1 Year Percent Change UR < -10%	--
1 Year Percent Change UR -10% to 0%	0.96
1 Year Percent Change UR 0% to 8%	0.99
1 Year Percent Change UR 8% to 25%	0.97
1 Year Percent Change UR > 25%	1.16+
12 Month Lagged UR	1.03
N	16115

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Unemployment and Relationship Status/Quality by Race and Baseline Education

	Percent No Relationship	Percent Married	Percent Cohabiting	Percent of Marriages Low Quality	Percent of Cohabitations Low Quality
<i>Mother's Race</i>					
White	21%	59%	20%	10%	20%
Black	49%	20%	31%	16%	15%
Hispanic	29%	37%	34%	19%	22%
<i>Mother's Education at Baseline</i>					
Less Than HS	42%	22%	36%	21%	22%
HS Diploma	41%	27%	32%	16%	14%
Post-Secondary	37%	39%	24%	15%	16%
College or More	13%	81%	6%	9%	14%

Table 5. Unemployment and Relationship Status/Quality. Interactions with Race and Baseline Education (RRRs from Multinomial Logistic Regressions, City and Wave Fixed Effects)

	M1	M2
<i>High Quality Marriage (Reference)</i>		
<i>Low Quality Marriage</i>		
1 Year Percent Change UR	2.63*	2.12*
12 Month Lagged UR	1.01	1.01
White	1.00	
Black	1.81***	
Hispanic	2.22***	
White*Change UR	1.00	
Black*Change UR	0.41*	
Hispanic*Change UR	0.46*	
College		1.00
Post-Secondary		1.78***
HS Diploma		2.20***
Less than HS		2.86***
College*Change UR		1.00
Post-Secondary*Change UR		0.93
HS Diploma*Change UR		0.48*
Less than HS*Change UR		0.55+
<i>High Quality Cohabitation</i>		
1 Year Percent Change UR	1.75***	2.16*
12 Month Lagged UR	1.04	1.00
White	1.00	
Black	6.75***	
Hispanic	3.47***	
White*Change UR	1.00	
Black*Change UR	0.64*	
Hispanic*Change UR	0.78	
College		1.00
Post-Secondary		10.59***
HS Diploma		21.42***
Less than HS		29.78***
College*Change UR		1.00
Post-Secondary*Change UR		0.56
HS Diploma*Change UR		0.52+
Less than HS*Change UR		0.50+
<i>Low Quality Cohabitation</i>		
1 Year Percent Change UR	1.24	0.08
12 Month Lagged UR	1.00	0.98
White	1.00	
Black	4.29***	
Hispanic	3.22***	
White*Change UR	1.00	
Black*Change UR	1.00	
Hispanic*Change UR	0.75	
College		1.00
Post-Secondary		9.52***

HS Diploma		18.03***
Less than HS		39.84***
College*Change UR		1.00
Post-Secondary*Change UR		15.12
HS Diploma*Change UR		9.58
Less than HS*Change UR		10.16

No Relationship

1 Year Percent Change UR	1.35*	1.17
12 Month Lagged UR	1.04+	1.01
White	1.00	
Black	9.34***	
Hispanic	2.96***	
White*Change UR	1.00	
Black*Change UR	0.86	
Hispanic*Change UR	0.76	
College		1.00
Post-Secondary		6.85***
HS Diploma		11.12***
Less than HS		15.95***
College*Change UR		1.00
Post-Secondary*Change UR		1.05
HS Diploma*Change UR		0.89
Less than HS*Change UR		0.79
N	15498	16097

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

FIGURES

Figure 1. MSA Unemployment Rates – Levels and Changes (1998-2010)

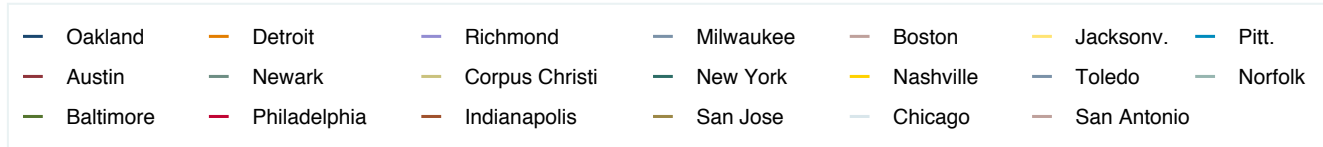
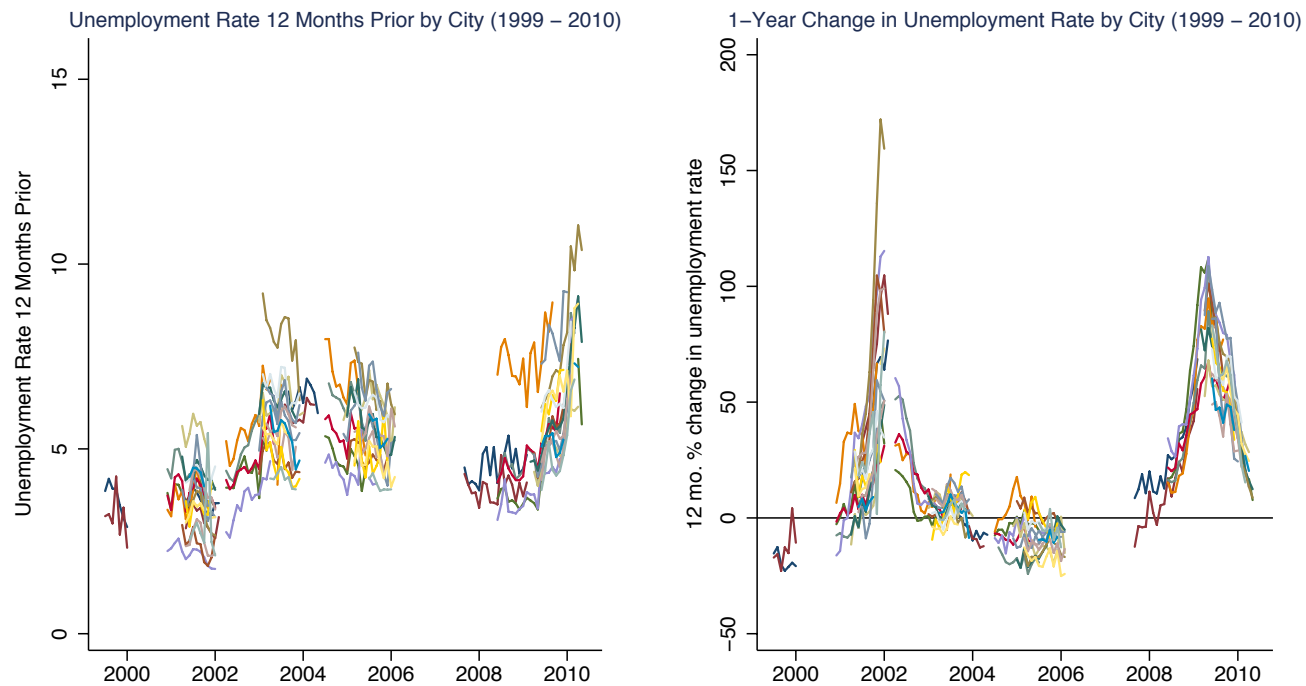


Figure 2. Predicted Share of Married Mothers in Low-Quality Unions by Percent Change in Unemployment

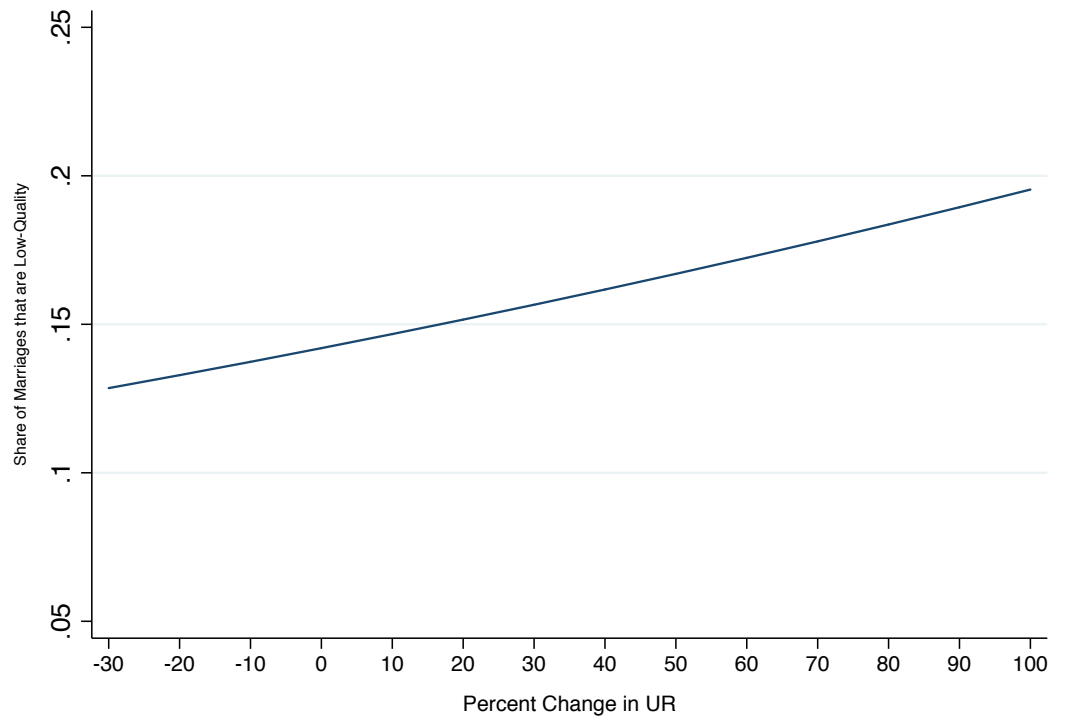
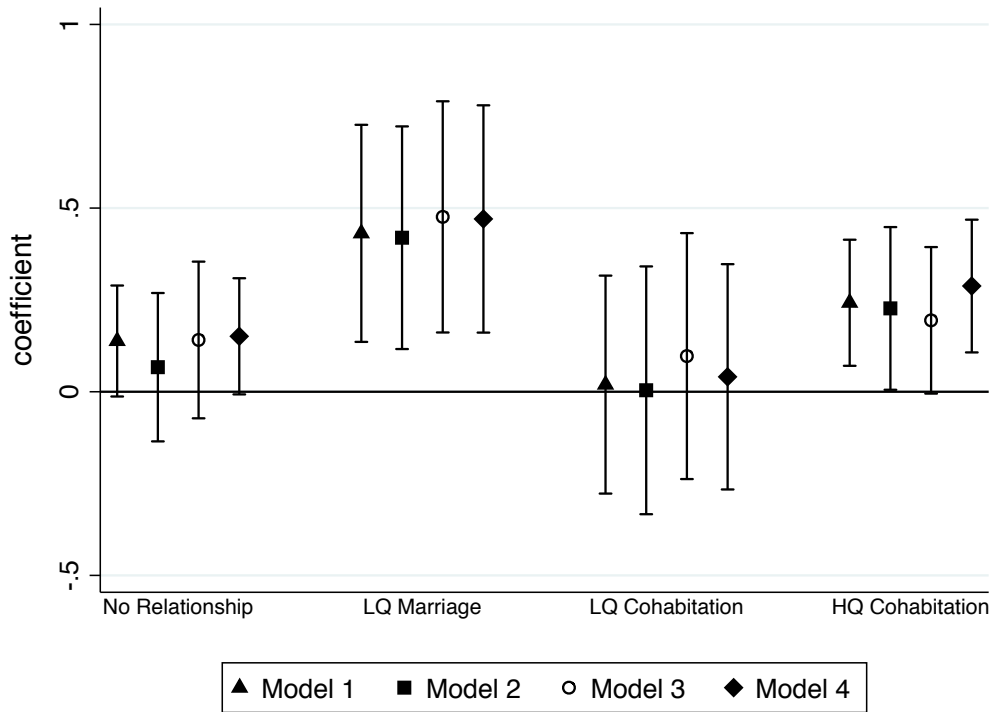


Figure 3. Robustness of the Effect of Percent Change in Unemployment on Relationship Status/Quality (Coefficients from Multinomial Logistic Regressions, City and Wave Fixed-Effects)



Note: The reference category is high quality marriage. Model 1 is identical to that presented in Table 2 (M3). Model 2 includes controls for mother's race, baseline education, marital status at the birth of the focal child, and focal child's age at each follow-up interview. Model 3 includes controls for duration in months in current relationship status (no relationship, married, or cohabiting) as well as a control for the age of the youngest child in the household, the presence of any child under age 2, and the number of children in the household. Model 4 replicates the specification from Model 1, but excludes person-wave observations made for respondents not resident in the same state as at baseline.

Figure 4. Predicted Share of Marriages that are Low Quality by Race and Change in Unemployment

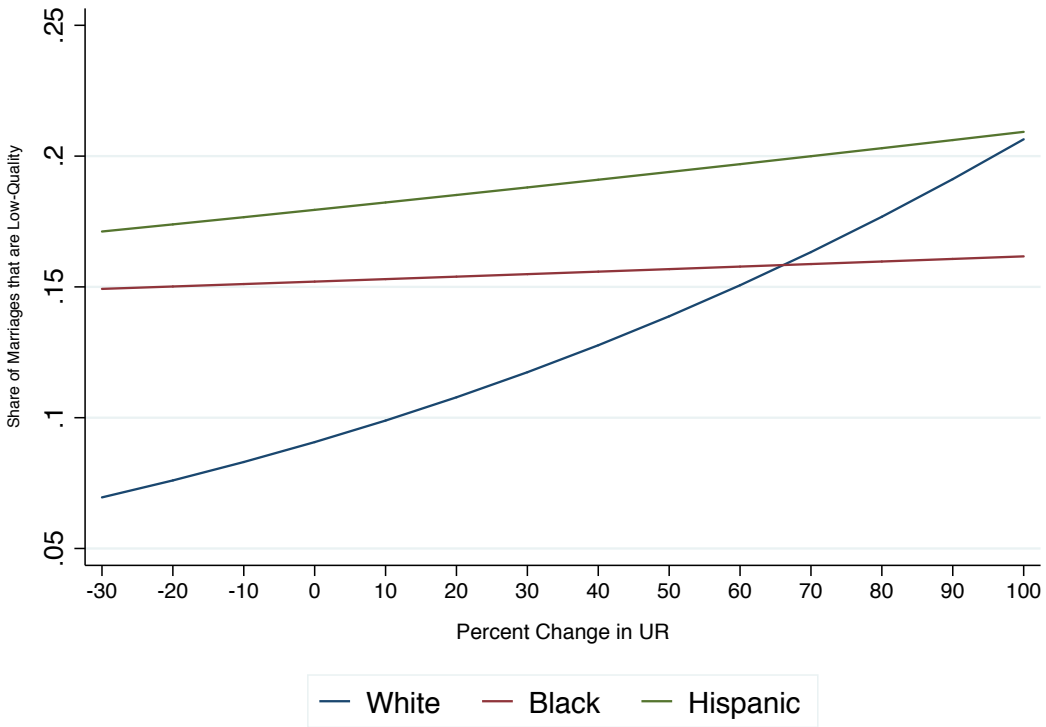


Figure 5. Predicted Share of Marriages that are Low Quality by Baseline Education and Change in Unemployment

