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**UNINTENDED FERTILITY AND THE STABILITY OF
CORESIDENTIAL RELATIONSHIPS**

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Abstract

Having an unintended birth is associated with maternal and child health outcomes, the mother-child relationship, and subsequent fertility. Some evidence tentatively suggests that having an unintended birth also increases the risk of relationship dissolution for the parents, but it is not clear whether this association derives from a causal effect or selection processes. This article uses data from the 2002 National Survey of Family Growth to compare union stability after intended and unintended births in coresidential relationships. Results show that cohabiting and married couples are more likely to dissolve after an unintended first or higher-order birth than after an intended first or higher-order birth, even when accounting for unobserved heterogeneity using multilevel modeling. We conclude that unintended fertility at any parity is disruptive and stressful for coresidential couples in ways that increase the risk of union dissolution.

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More than one third of births between 1997 and 2002 in the United States were unintended, including 23% of births to married women and 51% of births to cohabiting women (Chandra et al. 2005). Unintended birth rates in the U.S. are higher than in other developed countries and have been stable and perhaps even increasing in the 1990s after showing declines in earlier decades (Finer and Henshaw 2006; Morgan 2003). Unintended fertility, especially unwanted fertility, is associated with negative health consequences for both mothers and children (Bustan and Coker 1994; Hellerstedt et al. 1998; Hummer et al. 1995; Joyce, Kaestner, and Korenman 2000; Marsiglio and Mott 1988; Weller, Eberstein, and Bailey 1987). Further, unintended births can be considered a negative aspect of women's own lives, as they suggest difficulty in managing one's reproductive or sexual behavior and may negatively impact women's future behaviors, such as education and employment.

Having a child much earlier than desired or when one does not want to have children at all can influence later family and relationship behaviors and outcomes in addition to health and wellbeing. For instance, unintended births are associated with less positive mother-child relationships (Barber, Axinn, and Thornton 1999), and women with early unintended births are more likely to have subsequent unintended births (Guzzo and Hayford 2011). There is also some evidence that unintended first births are negatively associated with union stability (Manning, Smock, and Majumdar 2004; National Campaign 2008; Wu and Musick 2008). However, the association between birth wantedness and relationship dissolution is not well understood (Logan, Holcombe, Manlove, and Ryan 2007). Associations between higher-order births and relationship outcomes have not been examined empirically, and the roles of causal mechanisms and selection processes have not been explored.

This analysis fills a gap in the empirical literature by comparing relationship outcomes after first and higher-order intended and unintended births and by using fixed-effects models to assess the impact of unobserved individual and couple characteristics. We use data from the 2002 National Survey of Family Growth (NSFG) to model dissolution of coresidential relationships after a birth and to assess the contribution of subsequent births to risks of dissolution, focusing on the role of birth intendedness. We consider two competing explanations, a causal negative effect of unintended fertility and selection into unintended fertility, to explain the association between intendedness and union stability found in previous research. Results show that, consistent with past research, both married and cohabiting couples are more likely to separate after an unintended birth than an intended birth, even if only one member of the couple did not intend the birth. Extending the literature, our results also show that unintended births after a first birth strengthen this association. These results persist after accounting for stable unobserved characteristics, suggesting that there is a negative causal effect of unintended fertility on relationship stability beyond the role of selection based on individual or couple characteristics.

Fertility, intentionality, and relationship stability

Three decades of research has shown that children are associated with greater marital stability (Cherlin 1977; Heaton 1990; Lillard and Waite 1993; Morgan and Rindfuss 1985; Waite, Haggstrom, and Kanouse 1985; Waite and Lillard 1991). Evidence from the U.S., Britain, and Canada suggests that cohabiting parents have lower dissolution rates than cohabitators without children as well, although this association is less consistent than for married couples (Manning 2004; Steele et al. 2005; Wu 1995). Children are hypothesized to increase stability by increasing commitment to the relationship, by increasing relationship-specific investment, and by increasing

the normative pressures against dissolution (Becker 1981; Coleman 1988; Friedman, Hechter, and Kanazawa 1994; Thornton 1977). Some of the positive association between fertility and marital stability can also be attributed to selection, since less stable couples are likely to avoid childbearing, and relationship quality influences fertility behaviors (Rijken and Thomson 2011). However, the stabilizing effect of childbearing has been found to persist even when selection is accounted for (Lillard and Waite 1993).

The earlier literature on children and relationship outcomes does not consider possible differences in the impact of intended and unintended fertility on relationship dissolution, yet unintended births are likely to be far more disruptive than intended births. Research comparing the stability of marriage and cohabiting unions for children finds that relationships are more likely to dissolve after unintended first births than intended first births (Manning, Smock, and Majumdar 2004; Wu and Musick 2008). In addition, couples who have an unintended birth are more likely to transition to less stable unions (e.g., from marriage to cohabitation, or out of a coresidential relationship) in the two years following the birth than couples who have an intended birth (National Campaign 2008).

There is likely to be a direct negative effect of unintended fertility on relationship stability. Early childhood tends to be a stressful time for parents, with high physical demands of caring for a child, increased financial pressures, and decreases in leisure time (including time spent on relationship-building). The impact of these increased demands may be larger for couples who did not plan to have children together. Relationship quality generally declines after a birth (Belsky and Rovine 1990), and the decline is most sizeable among those with unintended fertility (Cox, Paley, Burchinal, and Payne 1999). Qualitative research reports mixed feelings among women – unplanned pregnancies may increase commitment (Kendall et al. 2005), but

they also introduce stress into a relationship (Lifflander et al. 2007). Even women who feel closer to their partners during an unintended pregnancy may experience increased conflict after the baby is born (Kendall et al. 2005).

Couple disagreement on birth intentionality, which is fairly common (Williams 1994; Korenman, Kaestner, and Joyce 2002) but has not been explored in prior work, may also impact relationship stability. During the period 1997-2001, an estimated 22 % of mothers – including 29% of those cohabiting and 18% of those married at the time of the birth – reported that they and the baby’s father did not agree on whether the birth was intended or they did not know the father’s feelings toward the birth (Chandra et al. 2005). In terms of union stability, couples who disagree on intentionality likely fall somewhere between couples who agree the birth was intended and couples who agree the birth was unintended. When at least one partner intended the birth, that person may feel prepared to take on the roles and duties of parenthood and can ease the burden for the other partner by helping them adjust and cope. Still, the other partner is likely to be displeased, and there is sometimes distrust between partners, where one partner feels “trapped” by the birth (Edin and Kefalas 2005). Thus, we hypothesize that an elevated risk of instability persists when even only one partner feels a birth was unintended.

Births beyond the first may also impact stability, with multiple unintended births likely to be particularly disruptive and stressful. Having another child quickly after the first child may overwhelm a couple, especially for those whose first child was unintended, even if they ultimately wanted to have more children in the future. Having an unplanned child several years after a couple has completed their desired family size may be equally disruptive. To our knowledge, no empirical research assesses how the sequencing of intended and unintended births is associated with relationship stability. A growing body of evidence suggests that women with

an early unintended births are at increased risk of having subsequent unintended births as well (Guzzo and Hayford 2011; Wildsmith, Guzzo, and Hayford 2010). It is important to establish how repeated unintended births as well as unintended fertility following intended fertility may be associated with relationship instability.

In addition to causal mechanisms, selection processes into intended and unintended fertility are likely associated with relationship outcomes. That is, the factors that determine whether couples have intended or unintended births may also be related to whether relationships dissolve. Most directly, perceived relationship stability or quality may influence couples' decision-making around childbearing. Evidence from the Netherlands shows that fertility rates are highest in couples with middle levels of relationship quality, with both the highest quality and lowest quality relationships having lower birth rates (Rijken and Thomson 2010); variation in intended and unintended birth rates has not been examined empirically, but it seems likely that intended births are least common in the lowest quality relationships. Certainly, unintended births do not serve as a sign of long-term commitment and confidence in the same way that deliberately planned births do. Further, given strong pronatalist norms in the United States, couples who choose not to have a child together may hold other non-traditional attitudes toward family life, such as greater acceptance of divorce, that increase their risk of union instability. It is also likely that some women may be inherently more likely to experience unintended fertility; some women may be poor contraceptors or more impulsive (Raffaelli and Crockett 2003) in a way that also increases their risk of union instability. Other psychological aspects likely influence unintended fertility and relationship stability as well. For instance, couples who are effective communicators may be able to both prevent unintended fertility and maintain a stable relationship. Low self-efficacy may lead to both unintended births and relationship difficulties. These characteristics are

difficult, if not impossible, to measure in survey data, but their omission may lead to overestimation of the effects of unintended fertility.

Selection is also an issue when considering higher-parity births. Only women whose relationship remains intact are “at risk” of having another birth with the same partner, and only those whose experience with first-time parenting was sufficiently enjoyable are likely to desire additional children. Relationship duration is important to consider here; as Teachman (2011) noted in a similar analyses, relationship stability often appears to increase over union duration because couples who have a high risk of instability will dissolve prior to having another child. If there are different underlying (but constant and unmeasured) risks of instability across couples, standard approaches to analyzing relationship duration may overstate the magnitude of dissolution risk.

Thus, to the extent that only the strongest couples have intended fertility, whereas less stable couples are more likely to report a birth as unintended, any association between intentionality and union stability may simply reflect the different types of couples who have different types of fertility. The characteristics, processes, and proclivities that increase the risk of a couple having an unintended birth may be the same as those that increase the risk of union dissolution. To account for these factors, we apply fixed-effects models for discrete-time data to account for observed and unobserved characteristics of individuals and couples (Teachman 2011). Fixed-effects models control for stable unobserved factors, such as risk-taking propensities and traditional family values, that may be related to both the independent variables of interest and the dependent variable – here, the risk of having an unintended birth and the risk of experiencing union dissolution. Selection according to time-varying characteristics is not modeled in this approach. For instance, if a deterioration in relationship quality increases the risk

of both unintended fertility and relationship dissolution, fixed-effects models will overestimate associations in the same way as traditional event-history models. However, accounting for the effect of stable characteristics still represents an improvement over previous research on the impact of unintended fertility on relationship stability.

Hypotheses

In summary, there are two ways to conceptualize the association between unintended fertility and subsequent relationship stability among coresidential couples. The first approach assumes a causal relationship, with unintended fertility increasing the risk of instability due to the disruptive nature of an unintended birth. The risk would be greatest for first unintended births, especially among those with multiple unintended births, but would also exist for a higher-parity unintended birth following an intended birth. To a lesser extent, disagreement would also increase the risk of instability relative to an intended birth.

Hypothesis 1: Unintended births, and to a lesser extent, disagreed-upon births increase the risk of instability relative to intended births, especially for a first birth and for multiple unintended or disagreed-upon births.

The second conceptualization also notes that unintended fertility is associated with a higher risk of instability but only because of selection and unobserved heterogeneity. That is, there are some couples who have a higher risk of both unintended and disagreed-upon fertility *and* a higher risk of union dissolution, and there are underlying common factors. Thus, once accounting for selection into who has an unintended or disagreed-upon birth, the association between unintendedness and instability would disappear. (A weaker version of this approach would propose that selection explains some, but not all, of the association between unintended fertility and relationship dissolution.)

Hypothesis 2: Unintended and disagreed-upon births are unrelated to union stability in fixed effects models that account for selection and unobserved heterogeneity.

Data and methods

Data

We use the 2002 cycle of the National Survey of Family Growth (NSFG), a nationally representative cross-sectional survey of U.S. women aged 15-44 designed to measure levels and trends in fertility. The NSFG, which interviewed 7,639 women, includes detailed birth and relationship histories, as well as measures of sociodemographic characteristics and family background. The NSFG does not include relationship information for noncoresidential births, so our analysis is restricted to the 2,649 women who had a child and were either cohabiting or married at their first birth. Our analysis is thus not representative of all unintended births. However, the majority of births (both intended and unintended) take place in coresidential relationships – 60% of all births in the NSFG occur in cohabiting or marital unions (Chandra et al. 2005) – and our analysis does describe these births. We further restrict the sample to women with valid information on the key independent variable of first birth intendedness (n=2,595). Because we wanted to examine parity-specific variations in unintended fertility and avoid the potential influences of stepchildren on relationship stability, we further restrict the analyses to cases where the woman reported this was her partner's first birth as well (n=2,186). We also excluded 111 women in the "other" race group, giving us a sample size of 2,075, as this group is racially/ethnically diverse and as such it is difficult to interpret coefficients. Finally, due to an error in the data collection process while in the field, a small number of cases were missing

information on the enddate of marriage, and we excluded these cases for a final sample size of 2,003.¹

The NSFG is the primary national source of information on birth intendedness, having included questions regarding the intendedness of births since its inception in 1973 (London, Peterson, and Piccinino 1995; Ventura et al. 2008). The NSFG does not directly inquire whether a birth was intended or wanted. Instead, wantedness and intendedness are constructs based on responses to a series of questions asked for every birth. Wantedness is derived from the question “Right before you became pregnant, did you yourself want to have a(nother) baby at any time in the future?” A negative answer would be characterized as an unwanted birth. If a woman responded affirmatively, she was asked about the timing of the pregnancy: “So would you say you became pregnant too soon, at about the right time, or later than you wanted?” Births that are identified as too late or at about the right time are considered wanted and intended. For births that are identified as occurring too soon, women are asked a follow-up question regarding the extent to which the births were too soon: “How much sooner than you wanted did you become pregnant?” Recent research has shown that births mistimed by two or more years (“seriously mistimed”) tend to have negative outcomes similar to those associated with unwanted births, whereas those that are mistimed by less than two years more closely resemble intended births (Abma, Mosher, and Jones 2008; Chandra et al. 2005; Lindberg, Finer, and Stokes-Prindle 2008; Pulley, Klerman, Tang, and Baker 2002). Building off this work, we consider births occurring two or more years too soon as seriously mistimed and thus unintended, while those occurring less than two years too soon are considered slightly mistimed and thus intended. Analyses using

¹ The NSFG imputed end dates for these cases. We tested models including the imputed data and found similar results to those presented here, but the consensus among users of the NSFG is that these cases should be excluded.

the more traditional measure of intendedness, where all mistimed births are grouped with unwanted, yielded substantively similar results.

Women were also asked about their partner's view of birth intendedness, using similar questions. They were asked "Right before you became pregnant, did the father want you to have a(nother) baby at any time in the future?" and if they responded affirmatively, they were asked "So would you say you became pregnant sooner than he wanted, at about the right time, or later than he wanted?" Births that the respondent reported her partner considered too late or at the right time are considered intended. Births the respondent reported her partner considered too soon or didn't care about the timing and those for which she was unsure of what her partner considered are characterized as unintended.

Discrete-time event history models

Our first approach is to use a standard technique to model union dissolution. We use discrete-time event history models to examine how the intendedness of a first birth occurring in a coresidential union and any subsequent fertility is related to the stability of the first-birth union. All analyses use person-months as the unit of analysis; women enter the sample the month of the first birth and leave when they experience relationship dissolution or are censored at the time of the survey if their relationship is still intact. The dependent variable is a dichotomous measure indicating whether the union is intact or not; analyses use logistic regression. Changes in relationship status (i.e. the marriage of cohabiting couples) are modeled in the analysis (see below) but not treated as outcomes; we focus on the duration of relationships, regardless of the legal status of the couple (cf. Manning 2004).

We analyze birth intendedness and relationship stability in two event history models. All models contain full demographic and relationship controls (discussed below); the models vary in

the specification of the fertility measures. In Model 1, we include only first birth intentionality. For first births, intentionality is defined as both partners agree the birth was intended (omitted), both partners agree it was unintended, and partner disagreement on intendedness. We explored whether it mattered which partner reported the birth as unintended, but these differences were not statistically significant, so we do not include them in the models presented here. In Model 2, we add time-varying and mutually exclusive measures of subsequent fertility and the intentionality of these births: no birth, only intended subsequent births for which both partners agree (omitted), only unintended subsequent births for which both partners agree, only subsequent births for which there is partner disagreement, and subsequent births with different intentionalities (that is, having more than one subsequent birth and having different types of intentionality for these births). We include a range of socioeconomic and demographic control variables that are associated with both relationship stability and birth intendedness: race/ethnicity and nativity (non-Hispanic white, non-Hispanic black, foreign-born Hispanic, and native-born Hispanic), and a time-varying measure of education (high school degree/GED vs. no degree). Because the 2002 cycle of the NSFG did not include a detailed education or employment history as in other cycles, we have limited measures of socioeconomic status. We use measures of family background to proxy socioeconomic status. These include the respondent's mother's level of education and whether the mother had a child prior to age 18 as well as family structure at age 14 (intact, stepfamily, or other).

Past union information includes whether the respondent had ever been married or cohabited before as well as whether her partner had ever been married before (partner cohabitation history was not asked). Current relationship type is measured through a time-varying variable indicating relationship status at birth and during the month: cohabiting at birth

and cohabiting now, cohabiting at birth and married now, cohabited prior to marriage but married at birth and married now, and married at birth and married now (omitted). We explored models disaggregating relationship trajectories by relationship status at conception and birth (not shown). Generally, it did not matter for either marriages or cohabitations whether conception occurred prior to coresidence, with one exception we will discuss in the results section. We also include a variable measuring the duration of the coresidential relationship prior to birth. Duration since last birth is specified as a piecewise, time-varying linear spline (less than 24 months, 24-48 months, and more than 48 months) because of the discontinuities between duration since last birth, subsequent fertility, and union dissolution. Other fertility-related variables include the woman's age at birth and whether the birth was conceived prior to the coresidential union (defined as whether the birth occurred within 8 months of when the couple began living together).

Fixed-effects models

To account for stable characteristics of individuals and couples that may affect both independent and dependent variables, we estimate fixed-effects models for repeatable events (Teachman 2011). Fixed-effects models include a person-specific variable, with a unique value for each person (or, in this case, couple), that incorporates all fixed characteristics that might be associated with the outcome variable. In order to estimate this model, multiple observations per person are necessary. Essentially, comparisons are made across observations for each person, and the person-specific variable drops out of the model. In this case, we take advantage of the fact that most women (about two thirds in this sample) experience more than one birth in a relationship to estimate the fixed-effects model, treating the interval after each birth as a separate observation. We use the same person-month data set as applied for our discrete-time event

history models, with women entering the sample at the time of the first birth and leaving at relationship end or being censored at the date of the survey. Because of the difference in modeling, though, some of the control variables are defined slightly differently. Union status is defined simply as cohabiting or married during the month, and we include a control for how long the relationship had been intact at the most recent birth. The structure of fixed-effects modeling also prohibits inclusion of fertility trajectories since births are modeled as separate events nested within a woman; we control for whether the birth was a first birth or a higher-parity birth.

One disadvantage of the fixed-effects model is that at least two observations with differing values for independent variables are necessary to estimate the model. Thus, only women who experienced more than one birth, with differing intentionalities, are used to estimate the coefficients for birth intentionality (N=134 for unintended births and N=476 for disagreed-upon births). The coefficient for an unintended birth can be interpreted as the difference in the odds of relationship dissolution compared across intended and unintended births in the same relationship, averaged across individuals. Furthermore, the effects of stable characteristics such as race, family background, and whether the couple cohabited before marriage cannot be estimated, although they are controlled for in the model. In addition, fixed-effects models produce biased coefficient estimates for characteristics that vary monotonically with time, such as age and relationship duration (Allison 2005; Teachman 2011). Finally, fixed-effects models only control for time-invariant characteristics. They do not account for time-varying unobserved characteristics that might confound results – for example, a disruption in the relationship that causes both unintended fertility and relationship dissolution. Still, fixed-effects models provide a more robust estimation of associations between unintended fertility and relationship outcomes. In this analysis, where our primary focus is on the effect of birth intendedness, the ability to reduce

bias in the estimate of these effects is worth the loss of efficiency and ability to estimate coefficients for fixed characteristics.

Results

Descriptive results

Table 1 shows weighted descriptive statistics for the analytic sample. Looking first at socioeconomic and demographic characteristics, the sample is largely non-Hispanic white; minorities, especially non-Hispanic blacks, are under-represented due to the sample restriction that the first birth occur within a cohabiting or marital union. Just over three-fourths of the women lived with both biological parents at age 14. About 30% of women reported that their mother's education was high school or less, about 40% reported that their mother had a high school degree, and about 30% reported that their mother had some college or higher. Among the women themselves, 79% had a high school degree at the time of their first birth.

– Table 1 here –

Turning now to relationship characteristics and history, 7% of women had cohabited with a different partner and 3% had been married to a different partner prior to their first-birth union. 7% were partnered with men who had been married before. The majority of women in the sample (83%) were married at the time of birth, with 56% having not cohabited with their partner prior to marriage and 27% married at birth but had cohabited prior to marriage with their partner. (The relatively large proportion of marital first births is driven by the sample restriction to births in coresidential relationships.) On average, the couples had been together in a coresidential relationship just under 3 years prior to their first birth. There were about 8 years of observation on average (not shown) between the first birth and the relationship's end or time of the survey. By the end of the period of observation, about a third of the relationships had

dissolved. This varied by the type of relationship at birth, with two-thirds of cohabiting relationships dissolving compared to only a quarter of marital relationships.

Finally, looking at the fertility characteristics, women were on average 24 years old at first birth, and about 22% conceived their child prior to the start of coresidence (e.g., their first birth occurred 8 months or less after the start of coresidence). In light of the relatively long average duration of relationships at the time of birth, this suggests that our sample has substantial variability in relationship status and strength prior to first births – some couples were coresiding in response to a pregnancy, while others (primarily married couples) had been together for a long time. Two-thirds of women reported that both she and her partner had intended their first birth (40% among cohabiting women and 71% among married women, not shown), while 7% reported that both she and her partner did not intend to get pregnant with their first child (21% among cohabiting women and 4% among married women, not shown). The remaining one-fourth of the women reported disagreement between themselves and their partner on whether the birth was intended or not (39% among cohabiting women and 24% among married women, not shown). By the end of the period of observation, about 63% of women had had a subsequent birth in the same union as their first birth (of the women without a second birth in the same union, 45% of relationships had dissolved and 55% were censored at the time of survey, not shown). 43% of women reported only intended subsequent births, 2% reported only unintended subsequent births, 10% reported only subsequent births where she and her partner disagreed upon their intentionality, and 8% had a combination of different types of births – intended, unintended, and/or disagreed-upon births.

At the bivariate level, first birth intendedness is associated with relationship stability. If the respondent reported that both she and her partner agreed their first birth was intended, only

22% experienced relationship dissolution by the end of the period of observation. Disagreement on intentionality or both partners agreeing the birth was unintended is positively associated with dissolution – 46% of relationships with a disagreed-upon birth and 77% of relationships with an unintended birth dissolved. The same is generally true for subsequent births and relationship stability – among women with only intended subsequent births, 21% experienced relationship dissolution, compared to 62% of those with only unintended subsequent births. Women with no subsequent births and those with disagreed-upon subsequent births were fairly similar, with about 40% experiencing dissolution. Those with different types of births were similar to those with only intended, with only a quarter experiencing dissolution; this category is primarily comprised of women who had at least one higher-order intended birth and then a disagreed-upon or unintended birth (not shown), suggesting that having at least one higher-order intended birth decreases the risk of dissolution.

Discrete-time event history results

Couples with unintended births are likely to have other characteristics associated with instability. We turn to multivariate event history models to account for some of these correlated characteristics. Table 2 details the results from the logistic regression of socioeconomic, demographic, relationship, and fertility variables on the stability of women’s cohabiting and marital unions. Results are presented in the form of odds ratios. As the dependent variable measures whether the relationship dissolved or not, a number less than one indicates a decreased risk of dissolution and a number greater than one indicates an increased risk of dissolution in a given person-month.

– Table 2 here –

Model 1 shows the association of first birth intentionality with union dissolution, controlling for demographic and relationship characteristics but not for subsequent fertility. Compared to women who reported that they and their partner intended their first birth, having an unintended first birth or disagreeing with their partner about birth intentionality is associated with a significantly higher risk of dissolution, even in the presence of socioeconomic, demographic, and relationship controls. When the respondent reported that both she and her partner did not intend the birth, the odds of dissolution are about 81% higher than if the birth was intended. Among couples with disagreement on intentionality (meaning at least one person considered the birth intended), the odds of dissolution are significantly higher than among couples in which the first birth was intended, by about 28%. Significance tests (not shown) demonstrated that the difference in the likelihood of dissolution between unintended births and disagreed-upon births is also statistically significant, with the odds of dissolution being about 40% higher if the birth was unintended by both partners than if at least one partner reported the birth was intended, as expected in Hypothesis 1.

Relationship type is the strongest predictor of subsequent relationship stability among parents, even more so than intentionality. Women who were cohabiting at birth (regardless of whether they had transitioned to marriage or not) have odds of dissolution four times higher than women who were married at birth and had not cohabited prior to marriage. Among women who were cohabiting at the time of their birth, differences in relationship stability between those who married subsequently and those who did not are not statistically significant (tests not shown). Women who cohabited prior to marriage but had a marital birth also have an elevated risk of dissolution compared to women who had a marital first birth and did not cohabit prior to marriage. Generally, having a pre-union conception is not significantly associated with union

dissolution. In additional models (not shown), we tested for interactions between relationship type and having pre-union conception; for those who were cohabiting at birth but subsequently married, women who were not cohabiting at the time of conception (and thus appear to have cohabited in response to the pregnancy and then married after the birth) have greater odds of dissolution than women who were cohabiting at the time of conception

Generally, other socioeconomic and demographic characteristics are not associated with relationship stability, though the risk of dissolution was lower for foreign-born Hispanic women relative to non-Hispanic white women ($OR=0.72$). The lack of significant socioeconomic and demographic predictors of dissolution seems surprising given previous findings of variation in union stability. This result occurs primarily because socioeconomic and demographic characteristics are strongly related to first birth circumstances (particularly intentionality and union status at first birth), so limiting our sample to coresidential first births and controlling for circumstances at the time of birth accounts for most variation in stability. Finally, it is worth noting that the odds of dissolution decrease with union duration and are inversely related to the woman's age at birth.

Model 2 adds information on subsequent fertility and intentionality to the first birth measures. The effects of the socioeconomic, demographic, and union formation variables change little. As such, we again focus our discussion of results on fertility intentionality. Two things are of note here. First, adding measures of subsequent fertility improves model fit, indicating that subsequent fertility and intentionality is an important independent predictor of relationship stability. In particular, relative to women who have only intended subsequent births (the modal category), women who do not have a second birth are about 65% more likely to experience relationship dissolution. (Of course, couples who break up are no longer at risk for a second birth

together. Because measures of fertility are time-varying, and models account for time elapsed since the first birth, our models capture effects of fertility on dissolution and not the reverse causal direction.) Women with only unintended subsequent births are 2.47 times more likely to experience dissolution than women with only intended births, and women with disagreed-upon births are 1.64 times more likely to experience dissolution, net of first birth intentionality.

Second, adding measures of subsequent fertility and intentionality does not substantially attenuate the effects of first birth intentionality – women with an unintended or disagreed-upon first birth remain significantly more likely to experience relationship dissolution, by about 73% and 25%, respectively. That is, the association between first birth intendedness and relationship dissolution does not appear to be explained by subsequent childbearing (or lack thereof). In models not shown, where we interacted first and second birth intentionality, we found that any combination of fertility and intentionality other than a first intended birth followed by only subsequent intended births increased the risk of union dissolution. Multiple unintended births, though relatively rare, were particularly detrimental to union stability.

In additional analyses (results available on request), we tested whether birth intentionality affects stability differently in cohabiting versus marital unions. Results were largely similar for married and cohabiting couples in that unintended and disagreed-upon fertility increases the likelihood of dissolution. However, there is some suggestion that the negative association between unintended births and relationship dissolution is stronger for married couples, though the risk of dissolution over time remains significantly higher overall among cohabiting couples. It may be that cohabiting unions are so inherently unstable that fertility (and intentionality) affects stability differently than it does for marriage. Additionally, married couples who do not intend to have children or disagree about fertility may be more unstable initially, given strong

pronatalist pressures and norms among married couples in the United States. The majority of first and second births among married couples (71% and 84%, respectively) are intended (not shown).

Fixed-effects results

Table 3 shows results from fixed-effects analyses of relationship dissolution after intended and unintended births (Model 3). Recall that only time-varying characteristics can be included in these models, and as a result coefficients are estimated based on changes in the characteristic. The coefficients for our central independent variables, birth intentionality, can be interpreted as the difference in the odds of dissolution in birth intervals following an unintended or disagreed-upon birth relative to intervals following an intended birth, the reference category. All stable characteristics of women and their relationships – including unobserved characteristics as well as variable included in previous models, such as the couple’s relationship status at the first birth, whether the first birth was legitimated, whether married couples cohabited before marriage, the age at the start of coresidence, family background, etc. – are accounted for in this model.

-Table 3 here-

Fixed-effects models show a large positive association between unintended fertility and relationship dissolution. The odds of dissolution are 3.42 times higher after an unintended birth than an intended birth, and this association is statistically significant ($p < .001$). The relationship shown in Models 1 and 2 is not attenuated when accounting for stable characteristics; in fact, the coefficient is larger in the fixed effects specification. The coefficient may be larger because unobserved characteristics not accounted for in Models 2 and 3 suppress the true association. In addition, fixed-effects models estimate subject-specific coefficients, rather than population-

averaged coefficients, which tend to be larger in magnitude (Teachman 2011). The association between couple disagreement about birth intentionality and dissolution is also positive, and about the same magnitude as in Model 1 above (OR = 1.26). However, because this coefficient is estimated based only on couples with more than one birth of different intentionalities, this model has less statistical power and the coefficient is not statistically significant ($p=.21$). Overall, Model 3 confirms the basic finding in the models above that unintended births negatively impact union stability, even accounting for observable characteristics and stable unobserved characteristics.

As noted above, this type of analysis can produce biased coefficient estimates for characteristics that vary monotonically with time. For example, couples transition from cohabitation to marriage, but not from marriage to cohabitation, so the coefficient for cohabitation during the month only varies in one direction. The negative coefficient for cohabitation in the model likely results from this bias – since couples only transition to marriage if their cohabiting relationship does not dissolve, the odds of dissolution during marriage are necessarily greater for these couples.

Discussion

Intendedness of births is associated with union stability for both cohabiting and married couples. Consistent with prior research, we found that couples with an unintended first birth are more likely to break up than those with an intended first birth, with those who disagree over birth intendedness falling in the middle. These associations persist even when controlling for individual and couple factors and accounting for subsequent fertility among couples who stayed together long enough to have additional children. Our results are consistent with the notion that unintended fertility has a direct negative effect on the stability of coresidential relationships. The

fixed effects models did not attenuate the strong association between unintended births and relationship dissolution found in the event history models, indicating that selection into unintended childbearing does not fully account for the impact of unintended fertility on union instability.

In models incorporating first and subsequent birth intentionality (Model 2), the association between unintended births and relationship dissolution is stronger for first births than for subsequent births. This association is robust to controls for relationship duration before the birth, suggesting that the association is not purely due to relationship instability predating the birth. Given that parenting is highly stressful and often drastically changes relationship dynamics, entering into parenthood when one or both partners feels as if they were not prepared to do so can have negative implications for the strength of the union and have a lasting impact.

Births to cohabiting parents are more likely to be unintended than births to married couples (Chandra et al. 2005; Finer and Henshaw 2006). However, controlling for this difference in intention status of births does not account for differences in stability between married and cohabiting parents. Consistent with previous research, cohabiting couples with a cohabiting birth have odds of dissolution nearly four times higher than married couples with a birth within marriage. Cohabiting parents who marry after a birth have even higher odds of dissolution. The positive associations between past cohabitation and the odds of dissolution in the current relationship are also robust to controls for birth intendedness, suggesting that levels of commitment in unions, especially marriages, differ beyond any contributions to union stability that shared childbearing may add. In contrast to relationship type, most individual-level characteristics are not significantly associated with relationship dissolution among parents when the intendedness of births is controlled.

Limitations

Due to data limitations, this analysis excludes noncoresidential couples who had a birth. Therefore, our analysis provides only a limited assessment of the relationship between unintended fertility and stability of all types of relationships, as coresidential couples may be better equipped to handle parenthood and have greater commitment to their union than those who do not live together. It is important to note, however, that the majority of unintended births in the United States take place in coresidential unions (Chandra et al. 2005), and thus understanding the impact of unintended births on these relationships is an important component of studying unintended fertility. Further, although couples who have an unintended birth are more likely to dissolve than couples with an intended birth, it is possible that unintended fertility is protective relative to childlessness. The fact that couples with no subsequent births have an elevated risk of dissolution relative to couples with intended second births would argue against this possibility, but having no shared children at all may be different from having only one child. Additional research comparing parents to childless couples and comparing coresidential and noncoresidential couples is necessary in order to evaluate this possibility. We also recognize that in using births rather than pregnancies (a limitation of survey data, which is known to underestimate pregnancies that end in abortion), our results cannot be generalized to understand the impact of unintended pregnancy. These findings would likely underestimate the negative effect of an unintended pregnancy, as couples who are more committed or feel more optimistic about shared parenthood and their union's future would be more likely to carry an unintended pregnancy to term.

The cross-sectional design of the NSFG also means we do not know women's fertility intentions prior to having children, and as with any work on fertility intentions, there are always

concerns about retrospective accuracy. Reports of unintendedness may shift over time as recall error, rationalization, and other factors change. In particular, women may be more likely to characterize a birth in a failed relationship as unintended than a birth in an intact relationship. If this is the case, our results may overstate the impact of unintended fertility on relationship stability. It is notable that we found a persistent (though sometimes attenuated) impact of having an unintended or disagreed-upon first birth even when followed by intended births in models in which we interacted first and second birth intentionality (not shown). Retrospective reclassification of births as unintended based on union demise should apply to births of all parities or perhaps to the most recent birth. The negative association between unintended first births followed by subsequent disagreed-upon or different types of births and dissolution suggests that our findings are not only driven by reporting issues, as it seems less likely that subsequent relationship dissolution would lead women to classify first births as unintended yet classify higher-parity births in the same relationship as disagreed-upon or report different types of births.

We are also limited by our reliance on women's reports of partner agreement, a limitation we share with other work on fertility intentions in couples (e.g., Korenman, Kaestner, and Joyce 2002; Santelli et al. 2009). Women may not accurately report or even know how their partner feels about a particular birth. Finally, our definition of unintended varies from earlier research, which may limit generalizability; however, we also conducted our analyses using the more traditional definition of unintended, and the results were substantively similar. We believe that this measure more accurately reflects how birth intentionality is associated with subsequent behaviors.

Conclusion

Although the consequences of unintended fertility for mothers and children have been studied extensively in the past, evidence on relationship consequences is more limited. We demonstrated that unintended fertility at any parity is negatively associated with union stability, and repeated unintended births are even more strongly negatively associated with stability. These associations are stronger if both partners reported the birth was unintended but hold even if only one partner felt that way. This association appears to derive from a causal relationship – having an unintended or disagreed-upon birth, at any parity, apparently causes disruptions in relationships and reduces union quality in such a way as to increase the risk of dissolution – rather than a selection process of unstable couples having unintended fertility.

The impact of an unintended birth on union stability does not vary greatly by parity of the birth or the existence and intentionality of previous and subsequent births – any unintended birth is associated with elevated risks of union dissolution, with the magnitude of the association greatest for those with multiple unintended births. Further, even in the relatively restricted analytic sample here, simplified by the exclusion of non-coresidential first births and women whose partners had children from previous relationships, incorporating multiple births increases the explanatory power of models predicting relationship outcomes. We showed here that having a birth in a cohabiting union is detrimental to long-term union stability (even if marriage occurs subsequently) relative to being married at birth, and this is true even when controlling for birth intentionality. These findings point to the complex and interdependent relationship between and among relationship and fertility behaviors. Studies of the association between fertility and union stability should consider intentionality in addition to other fertility characteristics, and the need to understand how fertility influences stability relative to childless couples remains.

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Table 1. Weighted Descriptive Statistics for Women with a Cohabiting or Marital First Birth

<i>Sociodemographic characteristics</i>		
Race-ethnicity		
	Non-Hispanic White	75.5%
	Non-Hispanic Black	5.7%
	Foreign-born Hispanic	11.5%
	Native-born Hispanic	7.3%
Family structure at age 14		
	Both biological parents	77.4%
	Stepfamily	8.6%
	Other family type	14.1%
Mother's education		
	Less than HS/missing	28.2%
	HS	40.8%
	Some college	17.7%
	College or more	13.3%
High school degree at time of birth		79.4%
<i>Union characteristics</i>		
Past cohabitation		7.4%
Past marriage		3.3%
Partner married before		7.4%
Relationship type at first birth		
	Cohabiting	17.2%
	Married, with cohabitation prior to marriage	56.0%
	Married, without cohabiting	26.8%
Relationship dissolution by end of observation (overall)		33.2%
Percent of cohabiting first birth relationships that dissolved		67.1%
Percent of marital first birth relationships w/ prior cohabitation that dissolved		23.5%
Percent of marital first birth relationships w/out prior cohabitation that dissolved		27.9%
Relationship duration prior to first birth (months)		34.1
<i>Fertility characteristics</i>		
Months between first birth & relationship end/survey		96.4
Age at first birth (years)		24.4
Pre-union conception		21.9%
First birth intendedness		
	Both intended	66.6%
	Both unintended	7.4%
	Disagreement on intendedness	26.0%
Subsequent fertility by relationship end/time of survey		
	No birth	36.9%
	Only intended	43.0%
	Only unintended	2.1%
	Only disagreed-upon	9.7%
	Births with different intentionalities	8.3%
<i>Relationship outcomes</i>		

Percent of relationships dissolved by first birth intentionality		
	Both intended	22.2%
	Both unintended	77.3%
	Disagreement on intendedness	46.3%
Percent of relationships dissolved by subsequent fertility and intentionality		
	No birth	45.2%
	Only intended births	21.0%
	Only unintended births	68.1%
	Only disagreed-upon births	41.3%
	Different types of births	25.1%
N		2003

Data: 2002 NSFG, women with first birth in coresidential relationship that was also partner's first birth. Percents may not total 100% due to rounding. Trajectories are numbered to facilitate discussion (see text).

Table 2. Odds Ratios from Logistic Regression of Birth Intendedness on Union Dissolution among Women with a Coresidential First Birth in the NSFG

		Model 1		Model 2	
<i>Socioeconomic & demographic characteristics</i>					
Race/ethnicity					
	Non-Hispanic White	--		--	
	Non-Hispanic Black	1.17		1.13	
	Native-born Hispanic	0.99		0.99	
	Foreign-born Hispanic	0.72	**	0.71	**
Family structure at age 14					
	Both biological parents	--		--	
	Stepfamily	1.12		1.09	
	Other family type	1.17		1.16	
Mother's education					
	Less than HS/missing	0.99		0.99	
	HS	--		--	
	Some college	1.19		1.18	
	College or more	1.02		1.01	
High school degree (time-varying)		1.04		1.04	
<i>Union characteristics</i>					
Past cohabitation		1.42	*	1.44	**
Past marriage		1.56	#	1.50	
Partner married before		1.09		1.09	
Relationship type (time-varying)					
	Cohabiting at birth, cohabiting now	4.05	***	3.82	***
	Cohabiting at birth, married now	4.25	***	4.36	***
	Cohabited prior to marriage, marital birth, married now	1.40	**	1.38	**
	No cohabitation, marital birth, married now	--		--	
Relationship duration prior to birth		1.00		0.99	
<i>Fertility characteristics</i>					
Months since birth (time-varying)					
	0-23 months	1.21	*	0.81	*
	24-48 months	--		--	
	More than 48 months	0.71	***	0.81	***
Age at birth		0.90	***	0.90	***
Pre-union conception		1.02		1.01	
1st birth intendedness					
	Both intended	--		--	
	Both unintended	1.81	***	1.71	***
	Disagreement on intendedness	1.28	**	1.21	*
Subsequent fertility					
	No birth			1.64	***
	Only intended			--	
	Only unintended			2.47	***

	Only disagreed-upon Births with different intentionalities	1.59 *** 1.33
Person months	170446	170446
Women	2003	2003
-2log likelihood	9462	9431

Data: 2002 NSFG, women with first birth in coresidential relationship that was also partner's first birth. . #p<.06; *p<.05; ** p<.01; *** p<0.001.

Table 3: Odds Ratios from Fixed-Effects Regression of Intendedness of Most Recent Birth on Union Dissolution among Women with a Coresidential First Birth in the NSFG

		Model 3	
<i>Demographic and relationship characteristics</i>			
High school degree		4.69	*
Relationship type			
	Cohabiting	0.004	***
	Married	--	
Relationship duration at most recent birth		1.03	***
<i>Fertility characteristics</i>			
Months since birth			
	0-23 months	0.28	***
	24-48 months	--	
	More than 48 months	3.42	***
Parity			
	First birth	0.49	**
	Higher order birth	--	
Intendedness of most recent birth			
	Both intended	--	
	Both unintended	3.52	***
	Disagreement on intendedness	1.38	
Person-months		49054	
Women		767	
-2log likelihood		5306	

Data: 2002 NSFG, women with first birth in coresidential relationship that was also partner's first birth. *p<.05 ** p<.01 *** p<.001. All covariates are time varying.