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Research Article

The social context of retrospective-prospective changes in pregnancy desire during the transition to adulthood: The role of fathers and intimate relationships

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The social context of retrospective-prospective changes in pregnancy desire during the transition to adulthood: The role of fathers and intimate relationships

Jennifer Barber¹

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Abstract

BACKGROUND

Researchers have questioned the accuracy of retrospective measures of unintended pregnancy, which ask women whether they wanted a pregnancy before it was conceived.

OBJECTIVE

We investigated whether pregnant women's retrospective recollections of their pre-conception desires for pregnancy were shaped by intimate relationships, their own reactions, and their perceptions of their partners' reactions to their pregnancies.

METHODS

We used the Relationship Dynamics and Social Life (RDLS) study, which included weekly survey interviews with 971 young women, of whom 175 experienced 203 pregnancies during the 2.5-year study period. We estimated logistic regression models of whether women's retrospective recollections of their pre-conception desires were stable, shifted positive, or shifted negative compared to their prospectively reported desires, along with formal mediation tests of potential mechanisms.

RESULTS

Women were more likely to remember their undesired pregnancies as desired before conception if they themselves reacted happily to the pregnancy, they were married or engaged, or they perceived their partner as reacting positively. The association with perceiving her partner as positive was mediated by her own happiness about the pregnancy.

CONCLUSION

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Retrospective recollections of pre-conception desire at least partially represent women's current feelings about a pregnancy. Post-conception happiness about a pregnancy may identify mothers and children whose health and well-being are at risk, but prospective measures are necessary to evaluate whether women got what they wanted.

CONTRIBUTION

This paper directly demonstrates that a woman's feelings about a specific pregnancy change over time alongside her experiences with the father of her pregnancy after conception.

1. Introduction

Undesired pregnancy is widespread in the United States – women report that approximately 50% of their pregnancies were undesired (usually called *unintended*)³ at the time of conception (Finer and Zolna 2016). Remembering a pregnancy as undesired is associated with delayed prenatal care, maternal complications and mortality, and morbidity and mortality among the infants themselves relative to pregnancies that are remembered as desired, in many settings (Gipson, Koenig, and Hindin 2008; Hall et al. 2017). However, researchers have questioned whether these associations are causal (Joyce, Kaestner, and Korenman 2000; Kost and Lindberg 2015).

The National Survey of Family Growth (NSFG) is the most widely used dataset to study undesired pregnancy, and many studies have based their own measures of pregnancy desire on the NSFG's measures (e.g., Aiken and Potter 2013; Barber, Kusunoki, and Gatny 2011; Shreffler et al. 2014). Analyses of the NSFG have dramatically enriched our understanding of women's feelings about their pregnancies. For example, although undesired birth rates have fallen over time (Finer and Zolna 2016), women who are socioeconomically disadvantaged, highly religious, or from underrepresented racial or ethnic minorities bear a greater burden of undesired births than others (Finer and Zolna 2016; Hartnett 2014; Hayford and Guzzo 2016; Hayford and Morgan 2008). The NSFG data have also been used to uncover several important

³ Our measures and other commonly used measures (e.g., the National Survey of Family Growth's retrospective measures) ask whether women *wanted* to get pregnant; we refer to this as pregnancy *desire*. Other researchers are beginning to use the word *desire* rather than *intention* for this concept as well (see, e.g., Kost, Maddow-Zimet, and Kochhar 2018; Kost and Zolna 2019). This is important because referring to undesired pregnancies as *unintended* erroneously attributes a lack of planning to women who did not get what they wanted.

paradoxes related to undesired pregnancies. For example, women classify only about two-thirds of pregnancies resulting from contraceptive failure as undesired (Trussell, Vaughan, and Stanford 1999), many women – especially Latinas – are happy about pregnancies they did not originally want (Aiken and Potter 2013; Hartnett 2012, 2014), and although women with unintended births tend to have subsequent unintended births (Guzzo and Hayford 2011), they also tend to use more effective postpartum contraceptive methods (Guzzo, Eickmeyer, and Hayford 2018) than women with desired births.

These paradoxes and others have spurred an intense focus on the measurement of pregnancy desire. One crucial feature of the repeated cross-sectional design of the NSFG is that it must assess a woman's desire for each of her pregnancies retrospectively, after the pregnancy (or birth) has occurred. It is unknown how accurately women can recall their pre-conception desire for a pregnancy after the conception (or birth) occurs, in part because their post-conception experiences may get in the way of accurately remembering their pre-conception feelings (Yeatman and Sennott 2015). This possible *ex post facto* rationalization has led researchers to question whether mothers who have negative experiences remember their pregnancies as undesired as a result of those negative experiences, regardless of their actual desire for the pregnancy before it was conceived (Guzzo and Hayford 2014; Joyce, Kaestner, and Korenman 2002).

The paucity of longitudinal data on US women's pregnancy desires has constrained researchers' ability to understand this potential bias and the dynamics of pregnancy desire more generally. In fact, few US datasets have prospective or longitudinal measurement of pregnancy desire, and even fewer have repeated measures of pregnancy desire referring to the same pregnancy.⁴ Three important longitudinal datasets that focus on pregnancy desire are the Continuity and Change in Contraceptive Use study, the National Survey of Fertility Barriers, and the Border Contraceptive Access Study, all of which have demonstrated that pregnancy desires change over time (Aiken and Potter 2013; Jones 2017; Ray et al. 2018). Although the first two studies explored change in women's desire over time and investigated both stable and dynamic predictors of that desire, neither study focused on changing feelings about the same pregnancy (Jones 2017; Ray et al. 2018). The third study compared prospective and retrospective measures of happy reactions to pregnancy among women who experienced contraceptive failure (Aiken and

⁴ The National Longitudinal Survey of Youth 1979 has retrospective measures of pregnancy desire and prospectively measured fertility *expectations* but not prospective fertility *desires*. This difference is important because questions about expectations ask women to combine what they want along with the barriers they expect to face in getting what they want. Although these data have been used for many important discoveries related to changing pregnancy expectations (e.g., Hayford 2009; Rackin and Morgan 2018), our focus is specifically on pregnancy *desires*.

Potter 2013). They found that happiness about an actual undesired pregnancy differed from prospective expectations for happiness about a hypothetical undesired pregnancy, particularly if the woman had believed her partner would be very upset about a pregnancy (Aiken and Potter 2013). We build on these studies with our specific focus on comparing *retrospectively* measured pregnancy desire – the most commonly used measure of undesired pregnancy – to *prospectively* measured desire for the same pregnancy, and the role of intimate relationships, perceived partner reactions, and women’s own happiness as predictors of change.

We use the Relationship Dynamics and Social Life (RDSL) study, which longitudinally followed a population-based random sample of young women with weekly survey interviews for 2.5 years. For the random sample of pregnancies that occurred during the study period, the dataset includes both pre- and post-conception measures of a woman’s feelings about a pregnancy, as well as pre- and post-conception measures of her perceptions of her partner’s feelings about the pregnancy.⁵ It also includes information about the intimate relationship context in which the pregnancy was conceived.

We address two specific research questions about the dynamics of pregnancy desire. First, after reporting a pregnancy, does a woman’s retrospective recollection of her pre-conception pregnancy desire match her prospectively reported pre-conception desire for pregnancy? Second, does a woman’s relationship with the father and her perception of his reaction to the pregnancy shape how she remembers those pre-conception feelings?

2. Background

2.1 Timing issues

We make two important temporal distinctions in our hypotheses and analyses: the timing of the question (prospective vs. retrospective; i.e., before or after a specific conception) and the time frame for the pregnancy (potential pregnancy vs. actual pregnancy; i.e., feelings about a future pregnancy before it is conceived or feelings about a pregnancy

⁵ RDSL did not interview partners; thus, we use women’s perceptions of their partners’ desire for pregnancy. Previous research demonstrates that there are two major predictors of these perceptions: a partner’s actual desire for pregnancy (accurate perception) and a woman’s own desire for pregnancy (projection) (Miller and Pasta 2002). A partner’s actual desire for pregnancy is a much stronger predictor of women’s perceptions. Further, our inclusion of women’s own pregnancy desire in the same model (by stratifying based on prospective desire) accounts (to some degree) for that component of women’s perceptions of their partners’ desire.

after it is conceived). Thus, there are four potential measurement strategies, as illustrated in Figure 1. Also note that these strategies could be applied to women, their partners, or anyone else who has feelings about their potential or actual pregnancies (e.g., mothers, mothers-in-law).

Figure 1: Strategies for measuring pregnancy desire

		Timing of question	
		Prospective (before conception)	Retrospective (after conception)
Time frame for the pregnancy	Potential pregnancy (before conception)	(1) e.g., How much <i>do</i> you want to get pregnant <i>in the future</i> ?	(2) e.g., How much <i>did</i> you want to get pregnant, <i>before you got pregnant</i> ?
	Actual pregnancy (after conception)	(3) e.g., How <i>would</i> you react <i>if you get pregnant</i> ?	(4) e.g., How <i>did</i> you react <i>when you found out you were pregnant</i> ?

In this analysis, our dependent variable represents the shift among pregnant women between boxes 1 and 2 – the difference between (2) her retrospective recollection of her pre-conception desire for a potential pregnancy and (1) her prospective desire for a potential pregnancy. Retrospectively measured post-conception reaction to a pregnancy (4) is a predictor and mediating variable in our models. The RDSL dataset does not contain a measure corresponding to (3), but for example the Border Contraceptive Access Study (Aiken and Potter 2013) asked women, “How would you feel if you became pregnant in the next three months?” (as well as how their partners would feel). We explicitly consider the linkages between these measures and how experiences at the time of conception or after conception shape women’s changing feelings about their pregnancies.

2.2 Conceptual model

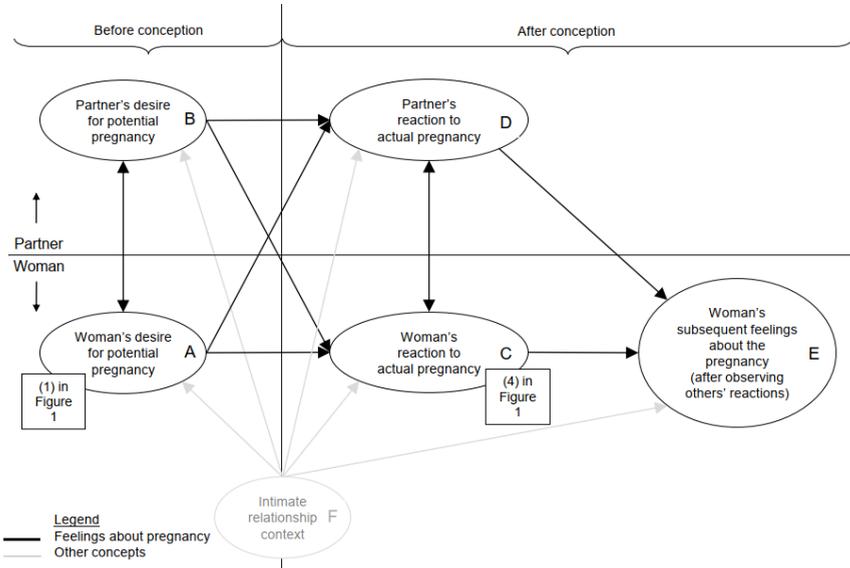
Figure 2 presents our conceptual model of feelings about pregnancy. The model has four quadrants: The top half represents a partner’s feelings about pregnancy, the bottom half represents a woman’s own feelings about pregnancy, the left half represents feelings before conception, and the right half represents feelings after conception.

In our conceptual model, a woman’s and her partner’s pre-conception desires for a potential pregnancy influence each other ($A \leftrightarrow B$) and are formed in the context of their

intimate relationship ($F \begin{matrix} \nearrow A \\ \searrow B \end{matrix}$). (For example, women and their partners have more desire for pregnancy in more serious relationships than in casual relationships.) If a pregnancy occurs, these pre-conception desires and the intimate relationship context fuel both partners' reactions to the actual pregnancy in three ways: First, all else equal, a woman who wanted a pregnancy will have a more positive reaction to that pregnancy than a woman who did not want a pregnancy ($A \rightarrow C$), and the same is true for her partner ($B \rightarrow D$). Second, the partner's pre-conception desire for a potential pregnancy will affect a woman's reaction to her actual pregnancy ($B \rightarrow C$) and vice versa ($A \rightarrow D$). Third, the intimate relationship context may also affect a woman's and her partner's reactions to a pregnancy, regardless of whether they originally wanted it ($F \begin{matrix} \nearrow C \\ \searrow D \end{matrix}$).

Women's reactions to an actual pregnancy and their partners' reactions are intertwined. All else equal, partners will be more positive about pregnancies that women themselves react happily to and vice versa ($C \leftrightarrow D$). In addition to a woman's ongoing consistent feelings (e.g., happy or unhappy) over time about a pregnancy ($C \rightarrow E$), a partner's reactions to a pregnancy will affect a woman's subsequent feelings about the pregnancy and can potentially change them ($D \rightarrow E$). In the following sections, we describe our hypotheses about how this happens and how it may influence strategies to retrospectively elicit women's pre-conception feelings about their pregnancies.

Figure 2: Conceptual model of feelings about pregnancy



2.3 The dynamics of pregnancy desire

Although values (evaluations of concepts like free speech, individualism, and honesty) are relatively stable, attitudes (positive or negative feelings about a specific thing) are more malleable in the face of new situations and knowledge (Krosnick and Alwin 1989). In the case of undesired pregnancy, women's attitudes about their pregnancies may be influenced by experiences at the time of conception, such as her intimate relationship, or by experiences after conception, such as others' reactions to the pregnancy.

Researchers originally assumed that women would become more positive about their pregnancies after giving birth and would thus overreport the extent to which pregnancies were desired (Westoff and Ryder 1977). However, analyses of the National Longitudinal Survey of Youth revealed little systematic bias in either direction (Joyce, Kaestner, and Korenman 2002). This is consistent with the idea that retrospective evaluations might instead reflect women's positive or negative experiences during pregnancy, birth, and motherhood. Trussell, Vaughan, and Stanford's (1999) discovery that contraceptive

failures were not always retrospectively reported as undesired pregnancies in the National Survey of Family Growth is consistent with the idea that women who were trying to prevent conception, but who reacted positively to pregnancy or motherhood, remembered themselves as having wanted to conceive.

Although retrospective measurement strategies like the NSFG's ask women to recall their pre-conception desire for pregnancy, this task is cognitively difficult if feelings about the pregnancy have changed. Schacter (1999) calls this phenomenon *consistency bias* – people tend to believe that how they feel *now* is how they have *always* felt. Women who are currently happy about their pregnancies are more likely to remember themselves as having wanted to get pregnant before they conceived, and women who are currently unhappy about their pregnancies are more likely to remember themselves as having not wanted to get pregnant before they conceived. Thus, we hypothesize that women with prospectively undesired pregnancies who react happily to their pregnancies will be more likely than women who react unhappily to shift positive in their retrospective evaluation of whether a pregnancy was desired before conception. Correspondingly, women with prospectively desired pregnancies who react unhappily will be more likely to shift negative (Hypothesis 1).

2.4 The importance of partners

Many of the models used to predict pregnancy and related behaviors share the assumption that it follows from a reasoned process in which individuals consider their options, evaluate potential consequences, and decide which actions to take (Coale 1972; Fishbein, Ajzen, and Flanders 1975; Johnson-Hanks et al. 2011; Miller 1994; Ronis 1992). The notion that individuals are more likely to perform behaviors that they feel positive toward and intend to pursue has a great deal of intuitive appeal. However, by definition, undesired pregnancies do not result from the desire to become pregnant.

Some undesired pregnancies can be attributed to structural factors that inhibit women from successfully controlling their fertility, such as lack of access to contraception (Bongaarts 1978; Miller et al. 2010). In addition to structural factors, according to many widely used demographic models of fertility – the cognitive-social model of fertility intention (Bachrach and Morgan 2013), the theory of reasoned action (Fishbein, Ajzen, and Flanders 1975), and Warren Miller's traits-desires-intentions-behavior (TDIB) framework (Miller 1994) – desire for future fertility is deeply embedded in young women's social contexts.

The TDIB framework focuses on the influence of the sexual partner on reproductive motivations and behaviors (e.g., Miller, Severy, and Pasta 2004). The framework posits that partners' desires shape the translation (or not) of women's own desires into subsequent intentions and behavior. Indeed, in addition to research by the TDIB theory's authors (Miller, Barber, and Schulz 2017; Miller and Pasta 1995), foundational research using the National Survey of Families and Households demonstrated that a husband's childbearing desire predicted his wife's subsequent intention and birth, net of the wife's own desire and intention (Thomson 1997). Thus, there is ample reason to believe that partners' pregnancy desires affect women's feelings and behaviors related to pregnancy.

Other researchers have reported related associations across study populations. One longitudinal study of Latino adolescents found that a young woman's perception that her partner wanted a pregnancy was a powerful predictor of subsequent pregnancy, regardless of her own desire to be pregnant (Rocca et al. 2010). Perceiving that a partner would be very upset about a pregnancy was a strong determinant of prospectively measured unhappiness about a potential pregnancy among adult Latina women (Aiken and Potter 2013). Edin and Kefalas (2005) demonstrated the powerful effect of a boyfriend saying "I want to have a baby by you" on inconsistent contraceptive use among young, poor, urban women. And in a cross-sectional study of adolescents, the perceived attitude of a boyfriend was the only significant predictor of whether a girl wanted to get pregnant (Cowley and Farley 2001).

Existing research has also uncovered a great deal of discordance in pregnancy desire or intention within couples, at least cross-sectionally. In a study of Mexican American couples in the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), Cabrera and colleagues (2009) found only 58% agreement about desire for pregnancy between partners. In their study of Latino adolescents, Rocca et al. (2010) found that young men and young women alike rated their partners as more desirous of pregnancy than themselves. Miller and Pasta (2002) found only 65% agreement in committed couples' desire to avoid pregnancy.

Given the strong association between partners' pregnancy desires and women's own pregnancy desires, women's perceptions of their partners' pregnancy desires and their continuing interactions with partners could potentially have a large influence on women's *evolving* feelings about pregnancy. Thus, we additionally posit an *ongoing* influence – partners' desires and interactions with partners as continually shaping women's own evolving feelings about pregnancy, both before and after conception.

Because these studies tend to focus on a specific type of couple (e.g., cohabiting or married, dating adolescents), they have not explored how different types of intimate

relationships contribute to feelings about pregnancy. However, given that parenting is easier with a partner participating in child rearing, it is likely that the seriousness of the relationship that produced a pregnancy would affect each partner's reaction to it.

Thus, we hypothesize that the probability of a positive shift in pregnancy desire will be higher (and the probability of a negative shift will be correspondingly lower) among women who prospectively perceived that their partners desired pregnancy relative to those who perceived that their partners did not desire pregnancy (Hypothesis 2). In addition, regardless of whether they prospectively perceived their partners as wanting a pregnancy, we hypothesize that the probability of a positive shift in pregnancy desire will be higher (and the probability of a negative shift will be correspondingly lower) for women who were in serious intimate relationships with their partners relative to those who were in less serious relationships (Hypothesis 3); as well as for women who perceived that their partners reacted positively to news of the pregnancy relative to those who perceived that their partners reacted negatively (Hypothesis 4).

3. Data and methods

3.1 Study design

The RDSL study was based on a simple random sample of young women, ages 18–19, residing in Genesee County, Michigan. The sample of 1,003 young women was drawn from driver's license and personal ID card records. A 60-minute face-to-face baseline survey interview was conducted between March 2008 and July 2009 to assess sociodemographic characteristics, attitudes, and early experiences related to pregnancy. The response rate was 84% of the randomly sampled individuals. (Among the sampled women who could be located, 94% agreed to participate). At the conclusion of the baseline interview, respondents were invited to participate in a 2.5-year follow-up study, with weekly online or telephone surveys assessing intimate relationships, contraceptive use, pregnancy desire, and pregnancy experiences.

Respondents received a \$5 bill in an advance letter and received an additional \$30 to participate in the baseline interview. Additional incentives were given to participate in the weekly surveys: \$5 per interview for the first four weeks, and afterward \$1 per interview with \$5 bonuses for on-time completion of five interviews in a row.

In all, 992 of the baseline interview respondents (99%) agreed to participate in the follow-up study, and 953 (96%) of those respondents completed at least one survey after

the baseline interview; 84% remained in the study for at least six months, 79% continued for at least 12 months, and 75% continued for at least 18 months (Barber et al. 2016). The follow-up study concluded in January 2012 and yielded 58,594 weekly interviews. The study participants reported 233 pregnancies in total during the study period. However, 4 (1.7%) of the 233 pregnancies were already ongoing at the time of the baseline interview, and those women were not asked about their prospective desire for those pregnancies before they were conceived. We do not use those pregnancies in any of our analyses, resulting in a total of 229 eligible pregnancies.

3.2 Missing data and analytic sample

Interviews completed up to 14 days after the prior interview referred to changes since then, but at 14 days, the reference period was adjusted to solely the week before, causing a period of missing data; 91% of interviews were completed before 14 days elapsed, and thus have no period of missing data. RDSL asked about all pregnancies (not just those discovered in the previous 14 days), and thus only those pregnancies that began *and* ended between interviews were missed. Prospective measures of pregnancy desire refer to the upcoming month; thus, there is only missing data if the gap between interviews is greater than 30 days. The modal number of days between interviews was eight, and the median was seven (not shown in tables).

Five (2%) of the 229 pregnancies were missing data on the dependent variable; the women never provided retrospective recollections of their pre-conception pregnancy desires after reporting those pregnancies. There was no missing data in the measures of women's reactions to their pregnancies or their prospective desire for pregnancy. However, three pregnancies (1%) could not be linked with a father. Eighteen additional pregnancies (8%) were missing some information about the father: Six were missing data on the woman's perception of her partner's prospective desire for a potential pregnancy; 12 were missing data on his reaction to the actual pregnancy. We estimated our main models on the remaining 203 pregnancies, which were conceived by 175 women (147 had one pregnancy, and 28 had two pregnancies). We also conducted two sensitivity analyses including the 18 pregnancies that could be linked to a father but were missing data on his prospective desire or reaction to the pregnancy. They are described in the results section. Information about missing data for all other measures is described below.

3.3 Abortion underreporting

As in other datasets commonly used to study the determinants of pregnancy and pregnancy desire – such as the National Survey of Family Growth, the National Longitudinal Survey of Youth 1997, and the National Longitudinal Study of Adolescent to Adult Health – abortion is likely to have been seriously underreported in the RDSL study (Lindberg et al. 2020). Of the 203 pregnancies in our sample, 184 ended during the study period and 19 were ongoing when the study ended. Birth outcomes for the 184 pregnancies that ended during the study period were as follows: 71% live births, 2% ectopic or tubal pregnancies, 10% abortions, 1% stillbirths, and 17% miscarriages. Of the 19 ongoing pregnancies, two were in the first trimester, 15 were in the second trimester, and one was in the third trimester (the gestation of the other pregnancy is unknown). In Michigan, abortion is legal until 19.6 weeks, and all but 2 of the 19 pregnancies were under that limit when the study ended.

In Michigan in 2013, the pregnancy rate for women ages 18–19 was 71 per 1,000. Of these, 43 (61%) were births and 18 (25%) were abortions. The remaining 14% were miscarriages or stillbirths (Kost, Maddow-Zimet, and Arpaia 2017). Based on those numbers, we would expect to see roughly 175 pregnancies to the RDSL women, including 106 births and 44 abortions. Instead, we see 184 pregnancies, including only 18 abortions, representing only about 40% of expected abortions. In their recent assessment of abortion underreporting, Lindberg and colleagues (2020) stated that in studies of pregnancy, the bias is “unpredictable and potentially substantial.” They warned that researchers should consider what women report in surveys “in place of an omitted abortion.” In the RDSL, which asked about pregnancies weekly, we think it is likely that women did not report new pregnancies they were planning to abort, or they avoided responding to the survey while they were pregnant and later failed to report the pregnancy after the abortion. Research suggests that these were likely undesired pregnancies (Kost, Maddow-Zimet, and Kochhar 2018). We conducted a sensitivity analysis using only births (including the two ongoing pregnancies that were past the legal abortion limit and the one pregnancy that resulted in a stillbirth). We report on those results below and also speculate about the consequences of this underreporting for our conclusions.

3.4 Measures

3.4.1 Pregnancy

In each weekly survey, respondents were asked, “Do you think there might be a chance that you are pregnant right now?” Respondents who answered yes were asked, “Has a pregnancy test indicated that you are pregnant?” Respondents who answered yes to the question about the pregnancy test were coded as pregnant, and each pregnancy was included in our analysis.

3.4.2 Prospectively measured pregnancy desires

In each weekly survey, nonpregnant respondents were asked, “How much do you want to get pregnant during the next month?” They were given response options of 0 through 5, with 0 labeled “not at all want” and 5 labeled “really want.”⁶ They were asked a parallel question about how much their current intimate partner wanted them to get pregnant: “How much do you think [partner name] wants you to get pregnant during the next month?” with the same response options.⁷

We used responses to these questions from the interview prior to the estimated week the pregnancy was conceived. The estimated week of conception was based on when the pregnancy was reported, the due date (which was updated during the weekly interviews), the weeks in which the woman had sex with the father, and/or the birth date (if during the study period).

⁶ Women were also asked, “How much do you want to *avoid* getting pregnant during the next month, with response options from 0 (“not at all”) through 5 (“really want to avoid”), with a parallel question about their partner. Because the prospective and retrospective measures of desire *for* pregnancy match well and the prospective question about desire to avoid pregnancy does not have a parallel retrospective measure, we did not use the prospective measure of desire to avoid pregnancy in these analyses. However, previous research demonstrates that desire for pregnancy and desire to avoid pregnancy are highly correlated and are associated with the same individual-level predictors (Weitzman et al. 2017).

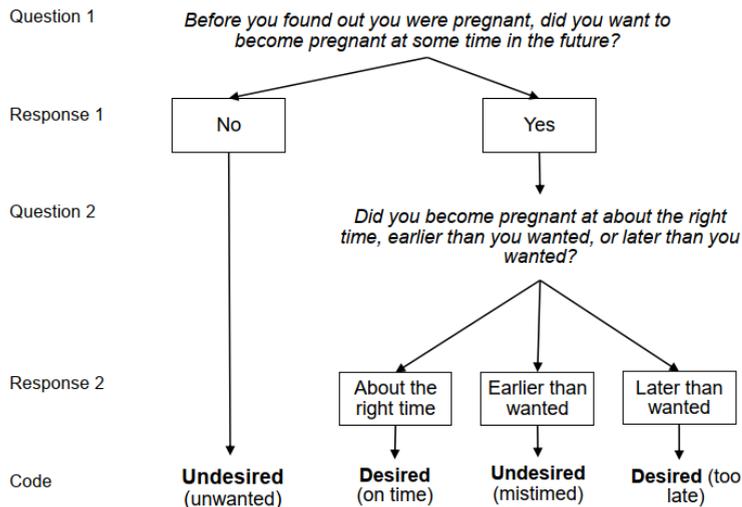
⁷ We also re-estimated our models without this variable; the remaining coefficients were very similar to those presented in the tables. We re-estimated our models a second time, replacing this measure with an indicator of whether the partner *told* the respondent he wanted her to get pregnant. All coefficients were very similar to those we present. The one small exception was that the coefficient for being African American was slightly smaller (1.46 rather than 1.65) and was not significant ($p = .057$) in the model for prospectively undesired pregnancies.

Seven respondents were not asked these questions in the interview prior to conception because they thought they already were pregnant (two respondents) or they *might* be pregnant (five respondents). For three of those respondents, we used the interview before they suspected or thought they were pregnant. The other four respondents likely conceived their pregnancy shortly before their first interview; in these cases, because they could not have yet known they were pregnant, we used prospective desire at the first interview.

3.4.3 Retrospectively measured pregnancy desire

Retrospective recollection of pre-conception pregnancy desire was coded 1 for “desired” and 0 for “undesired.” The measure was constructed from two questions asked during the interview when respondents first reported their pregnancies, based on the measure in the NSFG. It was coded as depicted in Figure 3.

Figure 3: Coding of retrospective recollection of pre-conception pregnancy desire



3.4.4 Pre- to post-conception change in pregnancy desire

Our dependent variable was the difference between a pregnant woman's prospective desire for a potential pregnancy and her retrospective recollection of that pre-conception desire. To facilitate comparison of these two measures, we recoded the prospective measure into two categories: desired and undesired. Past research demonstrates that any non-0 prospective desire for pregnancy is a strong predictor of subsequent pregnancy (Miller, Barber, and Gatny 2013), so for both a woman's desire and her perception of her partner's desire, we coded 0 as undesired and anything other than 0 (1 to 5) as desired.⁸

Because the dependent variable was dichotomous, women who were prospectively positive could not shift in a positive direction, and women who were prospectively negative could not shift in a negative direction. For this reason, we coded the measure of change as follows: Prospectively undesired pregnancies were coded as either (a) stably undesired or (b) positive shift (undesired → desired), and prospectively desired pregnancies were coded as either (a) stably desired or (b) negative shift (desired → undesired). As a result, we could not directly include prospective pregnancy desire as a covariate in our models. Thus, we estimated all models stratified by whether the pregnancy was prospectively undesired (n = 148 pregnancies) or desired (n = 55 pregnancies).

3.4.5 Reactions to the pregnancy

The woman's happiness about her pregnancy was measured retrospectively with the following question: "If on a scale of one to ten, a 1 means that you were very unhappy to be pregnant and a 10 means that you were very happy to be pregnant, tell me which number on the scale best describes how you felt when you found out you were pregnant." The question was asked in the interview in which she reported her pregnancy. Because the distribution among the response categories is sparse for our small sample of pregnancies, to maximize variance we dichotomized this measure; it was coded 1 for a reaction to the pregnancy that was above the median (> 6) and 0 otherwise.⁹ The point-

⁸ As a sensitivity analysis, we re-estimated our models using a measure where the bottom half of the responses (0, 1, 2) are coded as undesired and the top half (3, 4, 5) are coded as desired. Coefficients and p-values were similar and did not change our interpretation. For parsimony, we present only the models using the 0 vs. non-0 measure.

⁹ As a sensitivity analysis, we re-estimated our models using the midpoint of the response options (1–5 vs. 6–10) to dichotomize responses. Coefficients and p-values were similar and did not change our interpretation. For parsimony, we present only the models using the median-divided measure.

biserial correlation between the continuous and dichotomous measure was .86 (see Table A-1).

In the interview where the respondent first reported that she had told her partner about the pregnancy, which sometimes corresponded to when she reported the pregnancy and sometimes came later, she was asked for her perception of her partner's reaction to the pregnancy: "How did [partner name] react to you getting pregnant?" Response options were 0 (not at all positive) through 5 (extremely positive). Because the distribution among the response categories was sparse for our small sample, and the measure was highly skewed positive (44% responded with a 5), we dichotomized this measure; it was coded 1 for a reaction to the pregnancy that was above the median (> 3) and coded 0 otherwise.¹⁰ The point-biserial correlation between the continuous and dichotomous measures was .84 (see Table A-1).

3.4.6 Seriousness of the relationship at conception

In each interview, respondents were asked a series of questions to ascertain whether they had had an intimate partner *of any kind* during the prior week. These partners ranged from a spouse, fiancé, cohabiter, or romantic partner to someone with whom the respondent had had physical and/or emotional contact ("such as kissing, dating, spending time together, sex, or other activities"). Very rarely ($< 1\%$ of weeks), respondents reported having more than one partner during the prior week; in this case, they identified the most important or most serious partner.

If they identified a partner, respondents were asked a series of questions about their relationship with that partner, including whether they were engaged or married. We used a dichotomous indicator of whether the couple was married or engaged at the time of conception.¹¹ There were no missing data on this measure.

¹⁰ There were fewer than ten cases in the bottom half of the response options, which precludes a sensitivity analysis with a measure using the midpoint (0–2 vs. 3–5) to dichotomize responses.

¹¹ A sensitivity analysis instead used a four-category variable: married/engaged, cohabiting, exclusive dating, and other; only married/engaged differed from the other categories. Women were also asked whether they would marry their partner if they got pregnant in the upcoming month. Another sensitivity analysis instead used a three-category variable: (1) married or engaged; (2) not married/engaged but would marry the partner if pregnant; (3) not married/engaged and would not marry the partner. The second and third categories were not statistically different from each other in any model. We present only the models including the dichotomous indicator.

Each week, respondents were asked if their partner was the same as the prior week's partner. If not, they were asked whether they had ever mentioned the partner before. If the partner differed from the prior week but was previously mentioned, the respondent chose from a list of names or initials to identify that partner. Thus, RDSL has a continuous record of the relationship with each unique partner during the study period, regardless of whether the relationship was continuous or involved breakups. Respondents who were in an ongoing relationship at the baseline interview were asked the date the relationship had begun. We computed total duration (in months) with the father of the pregnancy by summing the number of days since he was first identified, subtracting any days they were not together, dividing that sum by 365, and multiplying by 12. There were no missing data for this variable in the 221 pregnancies that could be linked to a father.

3.4.7 Control variables

Undesired pregnancy rates differ by race and level of socioeconomic disadvantage, as do intimate relationship experiences (Finer and Zolna 2016; Kusunoki et al. 2016). Therefore, we included the following control variables in our models.

Respondents were asked, "Which of the following groups describe your racial background? Please select one or more groups: American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, Black or African American, or White." A preceding question about Hispanic ethnicity yielded 80 Latinas, whom we coded according to their answer to the race question, with 28 selecting African American. Because only seven respondents reported another race, we combined this group with white women, matching other published research using the RDSL dataset (Barber, Yarger, and Gatny 2015; Hayford et al. 2016; Kusunoki et al. 2016). Our measure was coded 1 for African American and 0 for other groups. There were no missing data for this measure. (Two respondents did not select a race category; interviewers identified both as white. For these two cases, we used the interviewer's perception of race.)

We used one dichotomous indicator of childhood disadvantage: biological mother did not graduate from high school. Four percent of cases were missing this information; they were coded at the mode, 0. We also included an indicator of whether the respondent had ever had a pregnancy before the current conception. Less than 1% of cases were missing data for this variable; they were coded at the mode, 0. Other indicators of childhood disadvantage and adolescent experiences with sex were not statistically significant in any models. For parsimony, we did not include them.

3.5 Analytic strategy

Below, we first present descriptive statistics to describe the analytic sample of women who got pregnant. Next, we describe young women’s feelings about their pregnancies and present cross-tabulations comparing their prospectively and retrospectively measured pre-conception desires. We then describe their perceptions of their partners’ prospective pregnancy desires and reactions to their pregnancies. Finally, we present stratified (by prospective pregnancy desire) unadjusted and adjusted logistic regression models (“logit” in Stata) predicting prospective-retrospective change over time in pre-conception desires for the same pregnancy. We adjusted for the clustering of pregnancies within women using the “cluster” option in Stata. We begin with the unadjusted models in order to compare those coefficients to models that adjust for other independent variables and to conduct formal mediation analyses (“ldecomp” in Stata) to test whether the decrease in coefficients across columns represented a statistically significant indirect effect.

4. Results

Table 1 presents descriptive statistics for the measures used in our analyses. In all, 32% of the women were married or engaged when they got pregnant. On average, their relationships had been ongoing for slightly over 16 months at the time of conception. On average, the relationships that led to pregnancy were more serious – more likely to be engaged/married and longer-lasting – than RDSL women’s relationships in general (Barber et al. 2017).

Table 1: Descriptive statistics for measures used in the analyses

Measure	n = 203 pregnancies			
	Mean	Std. Dev.	Min.	Max.
Seriousness of the relationship at conception				
Married or engaged	.32		0	1
Total duration (in exact months)	16.11	18.37	0	75.70
Control variables				
African American	.39		0	1
Mother’s education less than high school graduate	.12		0	1
Any prior pregnancy	.51		0	1

In all, 39% of the 203 pregnancies were conceived by African American women and 12% by women whose mothers had less than a high school education. More than half of the pregnancies were preceded by a past pregnancy.¹²

Table 2 shows that the pregnant women in the sample had a low desire for their pregnancies, regardless of whether desire was measured prospectively or retrospectively. The mean prospective desire for pregnancy was only .93 on a 0 to 5 scale. Only 27% of women had any desire for pregnancy before they conceived.¹³ Women retrospectively remembered 82% of their pregnancies as undesired before conception and 18% as desired.¹⁴ On average, however, pregnant women reacted relatively happily to their pregnancies; 6.11 out of 10 (49% were above the median response).

To assess stability and change, Table 3 presents the cross-tabulation of retrospective recollections of pre-conception pregnancy desire with prospective pregnancy desire. The row percentages show that in the prospectively undesired group (top row), which represented 73% of pregnancies, the vast majority (89%) were stably undesired and only 11% shifted positive. There was less stability for pregnancies that were prospectively desired (bottom row) – only about two-fifths (38%) were stably desired.¹⁵ However, only 27% of pregnancies were prospectively desired, so overall there was still a high level of stability (75%) among all pregnancies.

Overall, despite the temporal mismatches, women who prospectively desired a pregnancy were more likely to later remember it as desired than women who did not prospectively desire a pregnancy (38% vs. 11%). Correspondingly, those who did not prospectively desire a pregnancy were more likely to remember it as undesired than those who prospectively desired a pregnancy (89% vs. 62%).

¹² Other published research compared the full RDSL sample to the nationally representative sample of the NSFG (Ela and Budnick 2017). African American women were overrepresented in the RDSL sample (34%) compared to the US population (16%). Correspondingly, compared to the NSFG, a higher proportion of RDSL women experienced teen pregnancy (26% vs. 19%).

¹³ When we recoded pregnancies as prospectively desired when women responded within the top half of the scale (3, 4, 5) rather than anything but 0, that decreased to 20%.

¹⁴ This is slightly higher than the national prevalence of undesired pregnancy (measured with the same question) – 76% of pregnancies to women ages 15–19 and 59% of pregnancies to women ages 20–24 (Finer and Zolna 2016) – but this is not surprising because of the RDSL's larger proportion of African American women than the national population and the higher fraction of African American women's pregnancies that are retrospectively undesired (Finer and Zolna 2016).

¹⁵ Note that this fraction was higher for women whose pregnancies were more strongly desired (not shown): when prospective desire was 4 or 5 on the 0 to 5 scale, 56% and 59% of women remembered those pregnancies as desired, respectively.

Table 2 Descriptive statistics for measures of young women’s feelings about pregnancy

Measure	n = 203 pregnancies			
	Mean	Std. Dev.	Min.	Max.
Prospective desire for pregnancy				
Desire for pregnancy (0 = not at all; 5 = very much)	.93	1.68	0	5
Desired (any non-0 desire)	.27		0	1
Undesired (0 desire)	.73		0	1
Retrospective recollection of pre-conception pregnancy desire				
Undesired	.82		0	1
Desired	.18		0	1
Reaction to the pregnancy				
Happiness about the pregnancy (0 = very unhappy; 10 = very happy)	6.11	3.12	1	10
Felt happier than most women about the pregnancy (0 = below median; 1 = above median)	.49		0	1
Happiness about pregnancy above midpoint of response options	.56		0	1

Table 3: Cross-tabulation of prospective and retrospective desire (before conception) for pregnancy (n = 203 pregnancies)

		Retrospective		Row totals	Row percentages ^a	
		Undesired 82%	Desired 18%			
Prospective	Undesired	Stably undesired	Positive shift	148	89%	11%
	73%	132	16			
	Desired	Negative shift	Stably desired			
27%	34	21	55	62%	38%	
Column totals		166	37	203		
Column percentages^b		80%	43%			
		20%	57%			

Note: ^a p < .00001 for t-test of difference between 89% and 62%.

^b p < .00001 for t-test of difference between 80% and 43%.

The column percentages provide the story in the opposite temporal direction. Among the retrospectively undesired pregnancies (left column), 80% of respondents had prospectively reported no desire for pregnancy, while 20% had reported some desire for pregnancy. Among the retrospectively desired pregnancies (right column), slightly less than half of respondents (43%) had prospectively reported no desire for pregnancy, while slightly more than half (57%) had prospectively reported some desire for pregnancy.

Thus, the reports matched relatively well for the large group of retrospectively undesired pregnancies and less well for the smaller group of retrospectively desired pregnancies.

Table 4 describes pregnant women's perceptions of their partners' prospective desire for and reaction to a pregnancy. Overall, before their pregnancies were conceived, young women perceived a moderate desire for pregnancy from their partners: a mean of 1.56 on the 0 to 5 desire for pregnancy scale. More importantly, they prospectively perceived *more* desire from their partners than they felt themselves – they perceived non-0 desire for pregnancy from their partners for 43% of the pregnancies (versus only 27% for themselves). On average, women interpreted the reactions of the men who fathered their pregnancies to be positive: 3.76 on a scale from 0 to 5, with 64% above the median response and 84% above the mid-point of the response options.

Table 4: Descriptive statistics for measures of partner's feelings about pregnancy

(n = 203 pregnancies)				
Measure	Mean	Std. Dev.	Min.	Max.
Partner's prospective desire for pregnancy (woman's perception)				
Desire for pregnancy (0 = not at all; 5 = very much)	1.56	2.01	0	5
Desired (any non-0 desire)	.43		0	1
Undesired (0 desire)	.57		0	1
Desire for pregnancy in top half of response options	.33			
Partner's reaction to pregnancy (woman's perception)				
Reaction to the pregnancy (0 = not at all positive; 5 = extremely positive)	3.76	1.51	0	5
Reacted more positively to the pregnancy than most partners (0 = below median; 1 = above median)	.64		0	1
Reaction to the pregnancy in top half of response options	.84		0	1

Table 5 presents unadjusted (columns 1 and 4) and adjusted (columns 2, 3, 5, and 6) logistic regression models of change between prospectively and retrospectively measured desire for the same pregnancy over time. Columns 1 through 3 focus only on the 148 pregnancies that were prospectively undesired. The dependent variable for these pregnancies was a *positive* shift (from undesired to desired) relative to no change (stably undesired). Columns 4 through 6 include only the 55 pregnancies that were prospectively desired, for which the dependent variable was a *negative* shift (from desired to undesired) relative to no change (stably desired). Thus, our hypotheses predict opposite signs on the

coefficients in the two sets of models (increased log-odds of a positive shift and correspondingly decreased log-odds of a negative shift).

Table 5: Logistic regression models of the log-odds of prospectively measured and retrospectively measured shifts in pre-conception desire for pregnancy (coefficients; 95% confidence intervals in parentheses)

	Prospectively undesired pregnancies (n = 148)			Prospectively desired pregnancies (n = 55)		
	Positive shift (prospectively undesired-retrospectively desired) vs. stable undesired			Negative shift (prospectively desired-retrospectively undesired) vs. stable desired		
	unadjusted	adjusted	adjusted	unadjusted	adjusted	adjusted
	1	2	3	4	5	6
Reactions to actual pregnancy						
Woman felt happier than most women about her pregnancy	3.37 (1.29, 5.45)		4.25 (1.15, 7.35)	-1.89 (-3.53, -0.26)		-1.73 (-3.91, 0.46)
Partner reacted more positively to pregnancy than most partners (woman's perception)	1.28 (0.13, 2.44)		0.24 ^a (-1.06, 1.54)	-2.12 (-4.29, 0.05)		-0.36 (-2.83, 2.10)
Seriousness of the relationship at the time of conception						
Married or engaged	1.27 (0.20, 2.34)	1.42 (0.31, 2.54)	1.39 ^b (0.07, 2.71)	-0.84 (-1.97, 0.29)	-0.43 (-1.74, 0.88)	-0.24 (-1.58, 1.10)
Total duration (in exact months)	0.07 (-0.33, 0.47)	-0.004 (-0.47, 0.46)	-0.020 (-0.45, 0.41)	-0.71 (-0.19, -1.23)	-0.06 (-1.40, -0.12)	-0.06 (-0.12, -1.23)
Partner's prospective desire for pregnancy						
Partner had any desire for pregnancy (woman's perception)	-0.76 (-2.33, 0.81)	-0.71 (-2.33, .91)	-0.84 (-2.64, 0.96)	^c	^c	^c
Control variables						
African American	0.49 (-0.68, 1.67)	0.98 (-0.24, 2.20)	1.65 (0.12, 3.18)	-0.19 (-1.51, 1.14)	-1.35 (-2.80, 0.11)	-1.56 (-3.41, 0.29)
Woman's mother's education less than high school graduate	1.03 (-0.45, 2.51)	1.05 (-0.64, 2.74)	2.60 (0.53, 4.67)	-1.61 (-3.38, 0.16)	-1.93 (-3.71, -0.15)	-2.40 (-0.38, -4.42)
Any prior pregnancy	-0.40 (-1.57, 0.76)	-0.80 (-4.02, -1.50)	-1.32 (-2.82, 0.19)	-0.33 (-1.44, 0.77)	-0.56 (1.28, 4.43)	-0.58 (-2.21, 1.04)
Constant		-2.76	-6.29		2.85	4.40
pseudo-R ²		0.12	0.38		0.23	0.29

Note: The 148 prospectively undesired pregnancies were conceived by 129 women (110 women had one pregnancy; 19 women had two pregnancies each). The 55 prospectively desired pregnancies were conceived by 53 women (51 women had one pregnancy; two women had two pregnancies each). Seven women who had one undesired and one desired pregnancy are in both groups.

^a $p = .046$ in formal mediation test for whether coefficient is mediated (between columns 1 and 3) by woman's own reaction to the pregnancy.

^b $p = .064$ in formal mediation test for whether coefficient is mediated (between columns 2 and 3) by partner's reaction to the pregnancy.

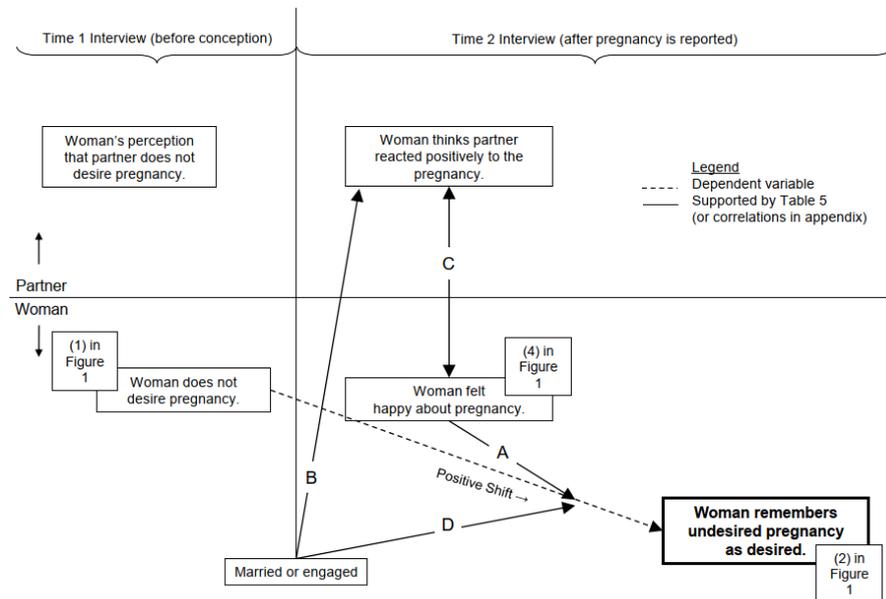
^c For the 55 pregnancies that were prospectively desired, only one woman perceived her partner as not wanting her to become pregnant; that pregnancy was retrospectively undesired. Thus, there were zero pregnancies where the woman prospectively desired the pregnancy, she perceived her partner as undesiring of her becoming pregnant, and she retrospectively remembered the pregnancy as desired.

Because the RDSL study measures do not correspond exactly to the conceptual model in Figure 2, Figure 4 provides a similar heuristic diagram using the measures available in the RDSL study. To facilitate interpretation, the diagram illustrates *undesired* pregnancies and is laid out similarly to Figure 2, with four quadrants representing the woman and her partner, and the interviews before and after conception. The dependent variable is indicated by the dashed line between the prospective indicator of pregnancy desire (women does not desire pregnancy) and the retrospective indicator of pre-conception desire (woman remembers undesired pregnancy as desired). However, these concepts are difficult to disentangle, and given that all feelings after conception were measured in the same survey interview, they are impossible to disentangle empirically. Note that although our conceptual model hypothesizes many links among these measures, our models are not designed to test all these associations. The arrows labeled A, B, C, and D in Figure 4 correspond to the significant coefficients in Table 5 and are presented only to guide our discussion of those models, not to indicate a measurement model or path analysis.

The unadjusted coefficients in column 1 show that three variables were associated with a positive shift in pregnancy desire for undesired pregnancies: whether the woman felt happy about her pregnancy, whether her partner reacted positively to the pregnancy, and the seriousness of the intimate relationship in which the pregnancy was conceived. Women who were married or engaged to be married, women whose partners reacted positively to their pregnancies, and/or women who felt happy about their pregnancies had higher log-odds of a positive shift – remembering their undesired pregnancies as desired – than women who were neither engaged nor married, who didn't feel happy about their pregnancies, or whose partners did not react positively to their pregnancies. Column 2 shows that the association between being married or engaged and experiencing a positive shift in pregnancy desire was actually stronger once we added the control variables.¹⁶

¹⁶ This is because women with prior pregnancies are more likely to be married or engaged but less likely to shift positive. Thus married/engaged women are surprisingly likely to shift positive once we account for their overrepresentation among women with prior pregnancies.

Figure 4 Heuristic diagram of empirical results for pregnant women who did not prospectively desire their pregnancies



Column 3 shows that women’s happiness about their pregnancies was associated with much higher log-odds of experiencing a positive shift in pregnancy desire. In other words, women who reacted happily to their undesired pregnancies were more likely to remember them as desired before conception relative to women who were less happy about their undesired pregnancies (arrow A). This is the case regardless of whether they were married/engaged or whether their partners reacted positively, or the control variables in the model.

Column 3 also shows that the association between a woman’s perception of her partner’s positive reaction to the pregnancy and a positive shift in desire was much smaller once we accounted for its association with the woman’s own reaction to her pregnancy (arrow C) and its association with a positive shift in desire (arrow A). A formal mediation test confirmed the presence of this indirect effect. Being married or engaged at the time of conception was also associated with a positive shift in pregnancy desire

regardless of the other variables in the model, and it was partially mediated by its association with the partner's more positive reaction to the pregnancy (arrows B and C).

Column 3 shows that African American women and those whose mothers did not graduate from high school were more likely to experience a positive shift in pregnancy desire once we accounted for their less happy reactions to their pregnancies. In other words, African American women and women whose mothers did not graduate from high school reacted less happily to their pregnancies yet were not correspondingly less likely than white women and/or women whose mothers had graduated from high school to experience a positive shift in desire.

The models for the 55 pregnancies that were prospectively desired are similar in many ways, although due to the small sample size they are merely suggestive. First, women in serious relationships who desired their pregnancies were less likely to shift negative than women in less serious relationships, net of the other factors in the model. Second, women who reacted happily to their desired pregnancies were less likely to shift negative than women who reacted less happily. And third, women with desired pregnancies whose mothers did not graduate from high school reacted less happily to their pregnancies but were surprisingly unlikely to shift negative. Also note that only one woman with a prospectively desired pregnancy perceived her partner to be undesirous. Due to this lack of variance, the measure could not be included in these models, but it suggests that women who prospectively desired a pregnancy were very unlikely to become pregnant if they did not perceive their partner as also desirous.

4.1. Additional sensitivity analyses

We re-estimated our models including the 18 additional pregnancies that were missing information about the father's prospective pregnancy desire or his reaction to the pregnancy ($n = 221$ pregnancies) but omitted these variables with missing data from our models. The analyses showed the same pattern of results as described above – women who felt happier than most women about their undesired pregnancies were more likely to shift positive, and the coefficient for being married or engaged was smaller in model 3 than in model 2, suggesting mediation. The results for models 4, 5, and 6 were also similar and did not change our interpretation.

We also re-estimated the models on the same sample, using multiple imputation (“mi” in Stata) to fill values for the father's prospective desire for pregnancy and the father's reaction to the pregnancy, so we could include those variables in the models.

These analyses were extremely similar to those presented in Table 4, with all key coefficients and confidence intervals of similar magnitude, and key decreases consistent with our mediation interpretation.

Finally, we re-estimated our models including only births, to provide further information about how the models might be influenced by abortion underreporting. The magnitude of the coefficients for the 93 prospectively undesired births differed slightly from what we present in the tables (in addition to the slightly larger standard errors corresponding to the smaller sample of pregnancies). First, *all* the women who reacted unhappily to their pregnancies but went on to give birth remained stable in their evaluation of their pregnancies as undesired; none of them shifted positive. Thus, we could not include women's happiness in the models, and we could not compare the unadjusted coefficients to coefficients that were adjusted for this important mediator. Second, women whose partners reacted positively were no more likely to shift positive than those whose partners reacted negatively among those who gave birth. This suggests that the difference between women whose partners reacted positively and those whose partners reacted negatively, in terms of their probability of shifting positive, was much larger for women who reported that their pregnancies ended in abortion than for women who gave birth. In other words, women who reported that their pregnancies ended in abortion were probably more strongly affected by their partners' reactions than women who gave birth. Third, the coefficient for (grand)mother's education less than high school was stronger in the unadjusted model of births compared to the unadjusted model of pregnancies, and was weaker in the fully adjusted model. Coefficients for the 40 prospectively desired births were strikingly similar in magnitude and significance level to those in the tables, with one exception: Everyone who eventually gave birth but whose partner reacted negatively to the pregnancy shifted negative. Thus overall, the models that are limited to births had somewhat weaker coefficients and wider confidence intervals than the models including pregnancies that women reported as ending in abortion or miscarriage, suggesting that perhaps the addition of the unreported abortions and miscarriages would further increase the magnitude and precision of the coefficients. Of course, the unreported abortions and miscarriages were not included in either model and may bias the coefficients in either direction.

5. Discussion

The vast majority of young pregnant women who prospectively reported that they did not desire a pregnancy later retrospectively characterized their pre-conception desire in accordance with what they prospectively reported – 89% said their pregnancy was undesired. Conversely, many (62%) of RDSL’s young pregnant women who prospectively reported that they desired a pregnancy later retrospectively characterized those pregnancies as undesired before they were conceived. However, the small sample of the latter group means that these results should be interpreted with caution.

Although RDSL’s sample of pregnancies is relatively small and we could not use experimental methods to establish causation, our analyses support the following theoretical interpretation: Regardless of whether they prospectively desire their pregnancies, women in serious relationships are more likely to remain or shift positive because their partners react more positively to the pregnancy, which in turn increases their own happiness about the pregnancy. In other words, this retrospective evaluation of pre-conception pregnancy desire is affected by the social context at the time of conception and by what happens after the pregnancy is conceived.

Women’s happiness or unhappiness about their pregnancies was associated with whether they retrospectively remembered their pregnancies as desired, regardless of their prospectively measured pregnancy desire (H1). In fact, in a model pooling all pregnancies but predicting retrospective pregnancy desire rather than change in desire, whether they felt happy about their pregnancy was the strongest predictor, at least as strong as the pregnancy desire they reported before they conceived the pregnancy (not shown in tables; available from authors on request). This is important because, as many others have argued, it suggests that the long-standing retrospective measure of “unintended” pregnancy based on the NSFG is not an accurate indicator of whether a pregnancy was undesired before it was conceived. Rather it also reflects the social context of conception and the reactions of important other people in young women’s lives. Thus, we join with others’ calls for using an indicator of whether pregnancies are acceptable or welcomed to reflect the environments into which babies are born rather than attempting to retrospectively measure whether they were originally desired or undesired. Others have demonstrated that women can be happy about their prospectively undesired pregnancies (Aiken 2015; Aiken and Trussell 2017; Hartnett 2012). Our analysis adds to this large and growing body of research by suggesting that women’s post-conception level of happiness about their pregnancies is likely to bias any attempt to retrospectively measure pre-conception feelings about a pregnancy.

The probability that women with undesired pregnancies shifted positive did not depend on whether they perceived their partners as desirous (H2). However, women's and their partners' prospective pregnancy desires were clearly intertwined. Only one out of the 55 pregnancies that women themselves desired was perceived as undesired by the partner. The RDSL was especially well designed for examining how women's *perceptions* of their partners' pregnancy desires were associated with their own evaluations of their pregnancies, which is important for two reasons. First, women's perceptions of their partners' desires affect their behavior (Edin and Kefalas 2005; Rocca et al. 2010). Second, partners' *actual* pregnancy desires are the strongest predictors of women's perceptions of those desires, so women's perceptions are likely to be a decent proxy for partners' actual desires (Miller, Severy, and Pasta 2004). However, the RDSL was not designed to examine whether a young woman's perceptions of her partner's pregnancy desires were accurate; future research should use longitudinal data with direct assessments from both partners to address this important issue.

Pregnant women in serious relationships with the fathers were more likely to shift positive about their undesired pregnancies and were less likely to shift negative about their desired pregnancies, regardless of whether they prospectively desired their pregnancies (H3). Although our models suggest that this may be in part because those fathers reacted more positively to undesired pregnancies, it is also net of those reactions. It is also net of the duration of the relationship at the time of conception. Overall, the intimate relationship in which a pregnancy is conceived is probably an important determinant of how the mother and father feel about it. Further research should investigate the qualitative differences in more versus less serious relationships that influence parents' feelings about pregnancies.

Finally, our models suggest that one reason pregnant women whose partners reacted positively to their undesired pregnancies were more likely to shift positive than women whose partners reacted less positively (H4) may be that partners' positive reactions increased women's own happiness about their pregnancies, which in turn reduced their ability to accurately recall their pregnancies as undesired before they were conceived. This supports our ideas about temporal consistency bias. RDSL did not ask women how other important people in their lives, such as parents or friends, reacted to the news of a pregnancy, but those reactions are likely to be important determinants of women's post-conception feelings about their pregnancies and thus their ability to accurately recall pre-conception feelings as well. Other research should investigate the role of important others' reactions.

6. Limitations

Pregnancies reported during the RDSL study are likely to be an undercount because women are unlikely to report pregnancies that they aborted or plan to abort (Groves et al. 2013; Lindberg et al. 2020; Lindberg and Scott 2018). This underreporting has two likely effects on our descriptive analysis: a positively biased distribution of pregnancy desire (aborted pregnancies are likely to be undesired), and an overestimate of the extent to which women shift their feelings in a positive direction after conception (or a corresponding underestimate in negative shifting). Additionally, if the independent variables associated with prospective or retrospective pregnancy desires or the shift between them are also associated with the propensity to report all pregnancies or report them accurately, this could also bias our results. For example, if there is an unmeasured underlying sensitivity to social desirability bias or some similar latent variable, the women who *reported* their aborted undesired pregnancies may have been more likely to report a positive shift than those who *did not report* them, and more likely to report that they were happy about their pregnancies and that their partners reacted positively to the pregnancies. This could result from the perceived stigma of conceiving a pregnancy that was prospectively undesired or was unhappily received by the woman or her partner, and would make the coefficients for our sample larger than the results in the population about which we want to generalize.

Unfortunately, the RDSL study did not interview the fathers of the pregnancies that occurred during the study period. Thus, our models rely on women's perceptions of their intimate partners' pre-conception desire for a potential pregnancy and reactions to an actual pregnancy. We recognize that women's own feelings likely play a role in how they perceive their partners' feelings. We hope that our models will spur future research that measures pre- and post-conception feelings about pregnancies among both partners.

The RDSL sample itself also has important limitations that we hope will encourage further research. The narrow geographic focus (a single county in Michigan) of the RDSL study is notable. However, this focus also minimized geographic variance in factors that were not the focus of the current analysis (such as labor markets and educational opportunities). In addition, although the sample was not nationally representative, Michigan falls around the national median in measures of cohabitation, marriage, age at first birth, completed family size, nonmarital childbearing, and teenage childbearing (Lesthaeghe and Neidert 2006). We do not suggest that the RDSL study was nationally representative; it was not. However, it was also not an outlier with regard to the family formation behaviors we analyzed.

Although the RDSL study interviewed a random sample of 1,003 young women, this group had only 233 pregnancies during the 2.5-year study period. Either a larger sample of women or a longer period of follow-up will be required to generate a larger random sample of pregnancies that includes information before conception. To make either of these approaches financially feasible, a “shared sampling” approach might be fruitful. For example, the National Social Life, Health, and Aging Project (NSHAP) sample was selected from the Health and Retirement Study’s (HRS) nationally representative household screening; HRS selected only respondents who were ages 51 to 56, while NSHAP’s sample consisted of adults ages 57 to 85. Similarly, existing large-scale studies, particularly those that are cross-sectional and no longer require respondent cooperation (such as the NSFG or the General Social Survey), could provide contact information for a follow-up study of a subsample of respondents who agreed and met some specific criteria.

The problem of the relatively small sample was exacerbated in the analysis of subgroup differences, such as those between pregnant African American and other women. Although 79 of the 203 (39%) pregnancies in our analytic sample occurred among African American women, this number of pregnancies was small for models that included multiple covariates. We hope that these analyses encourage further research on the important race differences in these processes.

The relatively small sample of pregnancies used in these analyses results in a higher probability of error (in terms of magnitude or sign) than estimates using larger samples (Gelman and Carlin 2014). Although we did not directly interpret the magnitude of our coefficients, our mediation models relied on the magnitude of the change in those coefficients. Our interpretations relied heavily on the sign of the coefficients. If the mediation tests were incorrect, or the sign of any coefficient incorrectly represented the underlying population, it would change our overall conclusions.

Another key weakness of the RDSL sample was that the women were young – ages 18 and 19. Given the different nature of undesired pregnancy among older women (such as lower rates and never-wanted rather than mistimed pregnancies), coupled with age differences in intimate relationships (for example, a higher proportion of older women are married), the role of the intimate relationship context in women’s feelings about their pregnancies is likely to be quite different among older women. We focused on young women for the same reason the RDSL focused on young women – the high rates of unintended pregnancy at these ages and the density of important decisions during this period of the life course. Future research should investigate these processes among older women.

Finally, another aspect of the RDSL's study design is crucially important in interpreting our results: Women were asked to retrospectively report their pre-conception desire for pregnancy very soon after they conceived. This may have affected our conclusions in two ways. First, although women had relatively few post-conception experiences that could have affected memories of their feelings before conception, others' reactions to their pregnancies may have been especially prominent in their minds at this point. It could be that women's feelings "settled in" after a longer period of being pregnant, and partners' reactions became less prominent determinants of their feelings. Second, the opposite process could have been at work – partners' reactions to women's pregnancies may have become cumulatively more important over time. Because the RDSL only retrospectively assessed pre-conception feelings during the interviews in which women first reported their pregnancies, future research should address these longer-term processes.

7. Conclusions

Picture a young woman who wanted to postpone pregnancy in a serious relationship with a partner who agreed. However, when they discovered her pregnancy, they were both happy and quickly adjusted to the idea of being parents earlier than they had planned. The woman had trouble remembering this happy event as originally undesired; she instead remembered this as something she wanted. Conversely, picture a young woman in a nonmarital relationship whose partner told her, "I want to have a baby with you," but did not mean it literally. Thinking her partner wanted her pregnant, however, she was surprised by his negative reaction when a pregnancy occurred. She quickly became unhappy about the pregnancy and was unable to remember wanting to be pregnant, instead remembering that she didn't want the pregnancy. In both cases, the woman's retrospective recollection of her pre-conception desire for pregnancy depended on the social context in which the pregnancy occurred – including the intimate relationship at the time of conception – and on events occurring after the conception – including her partner's (and likely others') and her own reaction to the pregnancy. Our analysis suggests that women's retrospective recollections of their pre-conception desires are connected to their and their partners' post-conception reactions to a pregnancy and that our typical measure of undesired pregnancy, assessed after conception or even after birth, is an inaccurate indicator of pre-conception desire for pregnancy.

To the extent that post-conception feelings about pregnancy are reliant on the social context in which those pregnancies developed, retrospective measures probably better capture the emotional environments into which young pregnancies are *born* than the emotional environments in which they are *conceived*. If the goal is to identify pregnancies with a high risk of negative maternal and child outcomes, why not ask about a woman's and her partner's feelings about a pregnancy *after* it is conceived, or even after it is born (Blake et al. 2007; Waller and Bitler 2008)? After all, although the vast majority of pregnant women who didn't want a pregnancy remained steady in their assessment of the pregnancy as undesired after it was conceived, 11% instead remembered the pregnancy as desired. And in our small sample of prospectively desired pregnancies, 62% of young women who wanted a pregnancy shifted negative before their baby was born. Given how rapidly intimate relationships and material circumstances change at these ages (Barber et al. 2017; Burton and Tucker 2009), some women were likely responding to those changes when their assessment of a pregnancy shifted. This is consistent with recent calls for replacing the long-standing measure of pregnancy "intendedness" with "supportability," an assessment that incorporates dynamic micro-level (e.g., partner, family, school, and health care) and macro-level (e.g., religion, culture, and policy) support in determining which pregnancies are at high risk for negative outcomes (Macleod 2016). It is also consistent with growing calls for measuring whether pregnancies are "acceptable" or "welcomed" (Aiken et al. 2016; Gómez et al. 2018; Gómez et al. 2019). And it is consistent with recent calls for better ways to identify pregnancies that may present challenges for infant and maternal health and well-being (Kost and Zolna 2019).

On the other hand, if the goal is to help women get what they (prospectively) want in terms of childbearing, or to understand whether women got what they wanted in terms of childbearing, then it is important to understand that retrospective assessments of their pre-conception desires (and likely their intentions as well) are probably biased by their subsequent experiences. Thus, although some women will adjust to something they did not want – 11% of women with an undesired pregnancy remembered it as being desired – asking them retrospectively does not provide an accurate indication of whether they got what they originally wanted. Controlling one's own reproductive behavior is a human right, and exploring whether and how some women achieve that control and others do not should be a high-priority topic for researchers and policy makers.

Given our small sample of pregnancies, particularly those that were desired before conception, we hope that our analyses motivate the collection of dynamic measures of pregnancy desire among a larger random sample of non-pregnant women in order to compare their pre- and post-conception evaluations of their pregnancies. Further, given

the complex and interrelated nature of pregnancy desires and abortion decisions, we hope future researchers can better motivate women to report pregnancies that will be aborted to further our understanding of the dynamic interplay between these feelings and behaviors.

The two groups of women in our analyses require different policy approaches to helping them get what they want in terms of childbearing. First, consider young women who did not want a pregnancy – they tended to also perceive their partners as undesirous, to perceive their partners' reactions to pregnancy as negative, and to be unhappy themselves. The vast majority of them (89%) remembered not wanting to become pregnant before they conceived. Although prospectively undesirous women were much less likely to get pregnant than women who wanted a pregnancy, those who were undesirous were such a large group that they had 73% of the pregnancies. This is a group that should be targeted for improved contraceptive access and use.

Second, consider young women who wanted a pregnancy. Nearly all (98%) of them also perceived that their partner wanted a pregnancy. This group is unlikely to have benefited from interventions to increase contraceptive use because they wanted a pregnancy and thought their partners wanted a pregnancy. However, for many of these women, it did not turn out as they hoped. One-quarter of the fathers whom women prospectively perceived as desirous reacted negatively to the pregnancy. The vast majority (82%) of women with negative partners reacted unhappily to their pregnancies themselves, and nearly two-thirds (62%) of them remembered their pregnancies as having been undesired. Although some of these women will subsequently find the social support they need to raise their children, some will not (Biggs et al. 2017). Broader interventions – such as sex education for young men and women that includes information about parenting roles, or structural changes that support pathways to adulthood via education and employment – might decrease the likelihood of this scenario. And access to abortion remains crucial for women in this group who become pregnant and later decide that they do not want to have a baby.

References

- Aiken, A.R.A. (2015). Happiness about unintended pregnancy and its relationship to contraceptive desires among a predominantly Latina cohort. *Perspectives on Sexual and Reproductive Health* 47(2): 99–106. doi:[10.1363/4123809](https://doi.org/10.1363/4123809).
- Aiken, A.R.A., Borrero, S., Callegari, L.S., and Dehlendorf, C. (2016). Rethinking the pregnancy planning paradigm: unintended conceptions or unrepresentative concepts? *Perspectives on Sexual and Reproductive Health* 48(3): 147–151. doi:[10.1363/48e10316](https://doi.org/10.1363/48e10316).
- Aiken, A.R.A. and Potter, J.E. (2013). Are Latina women ambivalent about pregnancies they are trying to prevent? Evidence from the Border Contraceptive Access study. *Perspectives on Sexual and Reproductive Health* 45(4): 196–203. doi:[10.1363/4519613](https://doi.org/10.1363/4519613).
- Aiken, A.R.A. and Trussell, J. (2017). Anticipated emotions about unintended pregnancy in relationship context: Are Latinas really happier?: Anticipated emotions about unintended pregnancy. *Journal of Marriage and Family* 79(2): 356–371. doi:[10.1111/jomf.12338](https://doi.org/10.1111/jomf.12338).
- Bachrach, C.A. and Morgan, S.P. (2013). A cognitive-social model of fertility intentions. *Population and Development Review* 39(3): 459–485. doi:[10.1111/j.1728-4457.2013.00612.x](https://doi.org/10.1111/j.1728-4457.2013.00612.x).
- Barber, J.S., Kusunoki, Y., and Gatny, H.H. (2011). Design and implementation of an online weekly journal to study unintended pregnancies. *Vienna Yearbook of Population Research / Vienna Institute of Demography*. Vienna: Austrian Academy of Sciences: 327–334.
- Barber, J.S., Kusunoki, Y., and Gatny, H.H. (2016). Relationship Dynamics and Social Life (RDSL) study, 2008–2012. Genesee County: Inter-university Consortium for Political and Social Research (ICPSR 34626). doi:[10.3886/ICPSR34626.v5](https://doi.org/10.3886/ICPSR34626.v5).
- Barber, J.S., Kusunoki, Y., Gatny, H.H., and Melendez, R. (2017). The relationship context of young pregnancies. *Law and Inequality: A Journal of Theory and Practice* 35(2): 174–197.

- Barber, J.S., Kusunoki, Y., Gatny, H.H., and Schulz, P. (2016). Participation in an intensive longitudinal study with weekly web surveys over 2.5 years. *Journal of Medical Internet Research* 18(6). doi:[10.2196/jmir.5422](https://doi.org/10.2196/jmir.5422).
- Barber, J.S., Yarger, J.E., and Gatny, H.H. (2015). Black-white differences in attitudes related to pregnancy among young women. *Demography* 52(3): 751–786. doi:[10.1007/s13524-015-0391-4](https://doi.org/10.1007/s13524-015-0391-4).
- Biggs, M.A., Upadhyay, U.D., McCulloch, C.E., and Foster, D.G. (2017). Women’s mental health and well-being 5 years after receiving or being denied an abortion: A prospective, longitudinal cohort study. *JAMA Psychiatry* 74(2): 169–178. doi:[10.1001/jamapsychiatry.2016.3478](https://doi.org/10.1001/jamapsychiatry.2016.3478).
- Blake, S.M., Kiely, M., Gard, C.C., El-Mohandes, A.A.E., El-Khorazaty, M.N., and the NIH-DC Initiative (2007). Pregnancy intentions and happiness among pregnant black women at high risk for adverse infant health outcomes. *Perspectives on Sexual and Reproductive Health* 39(4): 194–205. doi:[10.1363/3919407](https://doi.org/10.1363/3919407).
- Bongaarts, J. (1978). A framework for analyzing the proximate determinants of fertility. *Population and Development Review* 4(1): 105–132. doi:[10.2307/1972149](https://doi.org/10.2307/1972149).
- Burton, L.M. and Tucker, M.B. (2009). Romantic unions in an era of uncertainty: A post-Moynihan perspective on African American women and marriage. *The ANNALS of the American Academy of Political and Social Science* 621(1): 132–148.
- Cabrera, N.J., Shannon, J., Mitchell, S., and West, J. (2009). Mexican American mothers and fathers’ prenatal attitudes and father prenatal involvement: Links to mother-infant interaction and father engagement. *Sex Roles* 60(7–8): 510–526.
- Coale, A.J. (1972). *The growth and structure of human populations: A Mathematical investigation*. Princeton: Princeton University Press.
- Cowley, C. and Farley, T. (2001). Adolescent girls’ attitudes toward pregnancy: the importance of asking what the boyfriend wants. *The Journal of Family Practice* 50(7): 603–607.
- Edin, K. and Kefalas, M. (2005). *Promises I can keep*. Berkeley: University of California Press.

- Ela, E.J. and Budnick, J. (2017). Non-heterosexuality, relationships, and young women's contraceptive behavior. *Demography* 54(3): 887–909. doi:[10.1007/s13524-017-0578-y](https://doi.org/10.1007/s13524-017-0578-y).
- Finer, L.B. and Zolna, M.R. (2016). Declines in unintended pregnancy in the United States, 2008–2011. *New England Journal of Medicine* 374(9): 843–852. doi:[10.1056/NEJMsa1506575](https://doi.org/10.1056/NEJMsa1506575).
- Fishbein, M., Ajzen, I., and Flanders, N.A. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading: Don Mills.
- Gelman, A. and Carlin, J. (2014). Beyond power calculations: Assessing Type S (sign) and Type M (magnitude) errors. *Perspectives on Psychological Science* 9(6): 641–651. doi:[10.1177/1745691614551642](https://doi.org/10.1177/1745691614551642).
- Gipson, J.D., Koenig, M.A., and Hindin, M.J. (2008). The effects of unintended pregnancy on infant, child, and parental health: A review of the literature. *Studies in Family Planning* 39(1): 18–38. doi:[10.1111/j.1728-4465.2008.00148.x](https://doi.org/10.1111/j.1728-4465.2008.00148.x).
- Gómez, A.M., Arteaga, S., Ingraham, N., Arcara, J., and Villaseñor, E. (2018). It's not planned, but is it okay? The acceptability of unplanned pregnancy among young people. *Women's Health Issues* 28(5): 408–414. doi: [10.1016/j.whi.2018.07.001](https://doi.org/10.1016/j.whi.2018.07.001).
- Gómez, A.M., Arteaga, S., Villaseñor, E., Arcara, J., and Freihart, B. (2019). The misclassification of ambivalence in pregnancy intentions: A mixed-methods analysis. *Perspectives on Sexual and Reproductive Health* 51(1): 7–15. doi: [10.1363/psrh.12088](https://doi.org/10.1363/psrh.12088).
- Groves, R.M., Fowler, F.J., Couper, M.P., Lepkowski, J.M., Singer, E., and Tourangeau, R. (2013). *Survey Methodology*. New Jersey: John Wiley and Sons.
- Guzzo, K.B., Eickmeyer, K., and Hayford, S.R. (2018). Does postpartum contraceptive use vary by birth intendedness? *Perspectives on Sexual and Reproductive Health* 50(3): 129–138. doi:[10.1363/psrh.12074](https://doi.org/10.1363/psrh.12074).
- Guzzo, K.B. and Hayford, S. (2011). Fertility following an unintended first birth. *Demography* 48(4): 1493–1516. doi:[10.1007/s13524-011-0059-7](https://doi.org/10.1007/s13524-011-0059-7).
- Guzzo, K.B. and Hayford, S.R. (2014). Revisiting Retrospective Reporting of First-Birth Intendedness. *Maternal and Child Health Journal* 18(9): 2141–2147. doi: [10.1007/s10995-014-1462-7](https://doi.org/10.1007/s10995-014-1462-7).

- Hall, J.A., Benton, L., Copas, A., and Stephenson, J. (2017). Pregnancy intention and pregnancy outcome: Systematic review and meta-analysis. *Maternal and Child Health Journal* 21(3): 670–704. doi:[10.1007/s10995-016-2237-0](https://doi.org/10.1007/s10995-016-2237-0).
- Hartnett, C. (2014). White-Hispanic differences in meeting lifetime fertility intentions in the U.S. *Demographic Research* 30(43): 1245–1276. doi:[10.4054/DemRes.2014.30.43](https://doi.org/10.4054/DemRes.2014.30.43).
- Hartnett, C.S. (2012). Are Hispanic women happier about unintended births? *Population Research and Policy Review* 31(5): 683–701. doi: [10.1007/s11113-012-9252-7](https://doi.org/10.1007/s11113-012-9252-7).
- Hayford, S.R. (2009). The evolution of fertility expectations over the life course. *Demography* 46(4): 765–83. doi:[10.1353/dem.0.0073](https://doi.org/10.1353/dem.0.0073).
- Hayford, S.R. and Guzzo, K.B. (2016). Fifty years of unintended births: education gradients in unintended fertility in the US, 1960–2013. *Population and Development Review* 42(2): 313–341. doi:[10.1111/j.1728-4457.2016.00126.x](https://doi.org/10.1111/j.1728-4457.2016.00126.x).
- Hayford, S.R., Guzzo, K.B., Kusunoki, Y., and Barber, J.S. (2016). Perceived costs and benefits of early childbearing: New dimensions and predictive power. *Perspectives on Sexual and Reproductive Health* 48(2): 83–91. doi:[10.1363/48e9116](https://doi.org/10.1363/48e9116).
- Hayford, S.R. and Morgan, S.P. (2008). Religiosity and fertility in the United States: The role of fertility intentions. *Social Forces* 86(3): 1163–1188. doi: [10.1353/sof.0.0000](https://doi.org/10.1353/sof.0.0000).
- Johnson-Hanks, J.A., Bachrach, C.A., Morgan, S.P., and Kohler, H.-P. (2011). *Understanding family change and variation: Toward a theory of conjunctural action*. Dordrecht: Springer.
- Jones, R.K. (2017). Are uncertain fertility intentions a temporary or long-term outlook? Findings from a panel study. *Women's Health Issues* 27(1): 21–28. doi: [10.1016/j.whi.2016.10.001](https://doi.org/10.1016/j.whi.2016.10.001).
- Joyce, T.J., Kaestner, R., and Korenman, S. (2000). The effect of pregnancy intention on child development. *Demography* 37(1): 83–94. doi:[10.2307/2648098](https://doi.org/10.2307/2648098).
- Joyce, T.J., Kaestner, R., and Korenman, S. (2002). On the validity of retrospective assessments of pregnancy intention. *Demography* 39(1): 199–213. doi: [10.1353/dem.2002.0006](https://doi.org/10.1353/dem.2002.0006).

- Kost, K. and Lindberg, L. (2015). Pregnancy intentions, maternal behaviors, and infant health: Investigating relationships with new measures and propensity score analysis. *Demography* 52(1): 83–111. doi:[10.1007/s13524-014-0359-9](https://doi.org/10.1007/s13524-014-0359-9).
- Kost, K., Maddow-Zimet, I., and Arpaia, A. (2017). *Pregnancies, births and abortions among adolescents and young women in the United States, 2013: National and state trends by age, race and ethnicity*. New York: Guttmacher Institute.
- Kost, K., Maddow-Zimet, I., and Kochhar, S. (2018). *Pregnancy desires and pregnancies at the state level: Estimates for 2014*. New York: Guttmacher Institute.
- Kost, K. and Zolna, M. (2019). Challenging unintended pregnancy as an indicator of reproductive autonomy: A response. *Contraception* 100(1): 5–9. doi:[10.1016/j.contraception.2019.04.010](https://doi.org/10.1016/j.contraception.2019.04.010).
- Krosnick, J.A. and Alwin, D.E. (1989). Aging and susceptibility to attitude change. *Journal of Personality and Social Psychology* 57: 416–425.
- Kusunoki, Y., Barber, J.S., Ela, E.J., and Bucek, A. (2016). Black-white differences in sex and contraceptive use among young women. *Demography* 53(5): 1399–1428. doi:[10.1007/s13524-016-0507-5](https://doi.org/10.1007/s13524-016-0507-5).
- Lesthaeghe, R.J. and Neidert, L. (2006). The second demographic transition in the United States: Exception or textbook example? *Population and Development Review* 32(4): 669–698. doi:[j.1728-4457.2006.00146.x](https://doi.org/j.1728-4457.2006.00146.x).
- Lindberg, L., Kost, K., Maddow-Zimet, I., Desai, S., and Zolna, M. (2020). Abortion reporting in the United States: An assessment of three national fertility surveys. *Demography* 57(3): 899–925. doi:[10.1007/s13524-020-00886-4](https://doi.org/10.1007/s13524-020-00886-4).
- Lindberg, L. and Scott, R.H. (2018). Effect of ACASI on reporting of abortion and other pregnancy outcomes in the US National Survey of family growth. *Studies in Family Planning* 49(3): 259–278. doi:doi.org/10.1111/sifp.12068.
- Macleod, C.I. (2016). Public reproductive health and ‘unintended’ pregnancies: introducing the construct ‘supportability’. *Journal of Public Health* 38(3): e384–e391. doi:[10.1093/pubmed/fdv123](https://doi.org/10.1093/pubmed/fdv123).
- Miller, W.B. (1994). Childbearing motivations, desires, and intentions: A theoretical framework. *Genetic, Social and General Psychology Monographs* 120(2): 225–258.

- Miller, W.B. (2015). *The childbearing motivational system: Consciousness, executive functions, and the neural substrate*. Aptos: Transnational Family Research Institute.
- Miller, W.B., Barber, J.S., and Gatny, H.H. (2013). The effects of ambivalent fertility desires on pregnancy risk in young women in the USA. *Population Studies* 67(1): 25–38. doi:[10.1080/00324728.2012.738823](https://doi.org/10.1080/00324728.2012.738823).
- Miller, W.B., Barber, J.S., and Schulz, P. (2017). Do perceptions of their partners' childbearing desires affect young women's pregnancy risk? Further study of ambivalence. *Population Studies* 71(1): 101–116. doi:[10.1080/00324728.2016.1253858](https://doi.org/10.1080/00324728.2016.1253858).
- Miller, W.B., Bard, D.E., Pasta, D.J., and Rodgers, J.L. (2010). Biodemographic modeling of the links between fertility motivation and fertility outcomes in the NLSY79. *Demography* 47(2): 393–414. doi:[10.1353/dem.0.0107](https://doi.org/10.1353/dem.0.0107).
- Miller, W.B. and Pasta, D.J. (1995). Behavioral intentions: Which ones predict fertility behavior in married couples? *Journal of Applied Social Psychology* 25(6): 530–555. doi:[10.1111/j.1559-1816.1995.tb01766.x](https://doi.org/10.1111/j.1559-1816.1995.tb01766.x).
- Miller, W.B. and Pasta, D.J. (2002). The motivational substrate of unintended and unwanted pregnancy. *Journal of Applied Biobehavioral Research* 7(1): 1–29. doi:[10.1111/j.1751-9861.2002.tb00073.x](https://doi.org/10.1111/j.1751-9861.2002.tb00073.x).
- Miller, W.B., Severy, L., and Pasta, D. (2004). A framework for modelling fertility motivation in couples. *Population Studies* 58(2): 193–205. doi:[10.1080/0032472042000213712](https://doi.org/10.1080/0032472042000213712).
- Rackin, H. and Morgan, S.P. (2018). Prospective versus retrospective measurement of unwanted fertility: Strengths, weaknesses, and inconsistencies assessed for a cohort of US women. *Demographic Research* 39(3): 61–94. doi:[10.4054/DemRes.2018.39.3](https://doi.org/10.4054/DemRes.2018.39.3).
- Ray, C., Harcey, S., Greil, A.L., Tiemeyer, S., and McQuillan, J. (2018). Stability and change in personal fertility ideals among U.S. women in heterosexual relationships. *Demographic Research* 39(16): 459–486. doi:[10.4054/DemRes.2018.39.16](https://doi.org/10.4054/DemRes.2018.39.16).
- Rocca, C.H., Hubbard, A.E., Johnson-Hanks, J., Padian, N.S., and Minnis, A.M. (2010). Predictive ability and stability of adolescents' pregnancy intentions in a

- predominantly Latino community. *Studies in Family Planning* 41(3): 179–192. doi:[10.1111/j.1728-4465.2010.00242.x](https://doi.org/10.1111/j.1728-4465.2010.00242.x).
- Ronis, D.L. (1992). Conditional health threats: Health beliefs, decisions, and behaviors among adults. *Health Psychology* 11(2): 127–34. doi:[10.1037//0278-6133.11.2.127](https://doi.org/10.1037//0278-6133.11.2.127).
- Schacter, D.L. (1999). The seven sins of memory: Insights from psychology and cognitive neuroscience. *American Psychologist* 54(3): 182–203. doi:[10.1037//0003-066x.54.3.182](https://doi.org/10.1037//0003-066x.54.3.182).
- Shreffler, K.M., Greil, A.L., Mitchell, K.S., and McQuillan, J. (2014). Variation in pregnancy intendedness across U.S. women's pregnancies. *Maternal and Child Health Journal* 19(5): 932–938. doi:[10.1007/s10995-014-1615-8](https://doi.org/10.1007/s10995-014-1615-8).
- Thomson, E. (1997). Couple childbearing desires, intentions, and births. *Demography* 34(3): 343–354. doi:[10.2307/3038288](https://doi.org/10.2307/3038288).
- Trussell, J., Vaughan, B., and Stanford, J. (1999). Are all contraceptive failures unintended pregnancies? Evidence from the 1995 National Survey of Family Growth. *Family Planning Perspectives* 31(5): 246–260.
- Waller, M.R. and Bitler, M.P. (2008). The link between couples' pregnancy intentions and behavior: does it matter who is asked? *Perspectives on Sexual and Reproductive Health* 40(4): 194–201. doi:[10.1363/4019408](https://doi.org/10.1363/4019408).
- Weitzman, A., Barber, J.S., Kusunoki, Y., and England, P. (2017). Desire for and to avoid pregnancy during the transition to adulthood. *Journal of Marriage and Family* 79(4): 1060–1075. doi:[10.1111/jomf.12396](https://doi.org/10.1111/jomf.12396).
- Westoff, C.F. and Ryder, N.B. (1977). The predictive validity of reproductive intentions. *Demography* 14(4): 431–453. doi:[10.2307/2060589](https://doi.org/10.2307/2060589).
- Yeatman, S. and Sennott, C. (2015). The sensitivity of measures of unwanted and unintended pregnancy using retrospective and prospective reporting: Evidence from Malawi. *Maternal and Child Health Journal* 19(7): 1593–1600. doi:[10.1007/s10995-015-1669-2](https://doi.org/10.1007/s10995-015-1669-2).

