HHS Public Access

Author manuscript

Popul Stud (Camb). Author manuscript; available in PMC 2018 March 01.

Published in final edited form as:

Popul Stud (Camb). 2017 March ; 71(1): 101–116. doi:10.1080/00324728.2016.1253858.

Do Perceptions of Their Partners Affect Young Women's Pregnancy Risk? Further Study of Ambivalent Desires

Warren B. Miller,
Transnational Family Research Institute

Jennifer S. Barber, and
University of Michigan

Paul Schulz
University of Michigan

Abstract

We explore whether young women's perceptions of their sexual partners' childbearing desires contribute to their risk of pregnancy. We use weekly journal data collected from 787 women to measure their childbearing desires and their perceptions of their partners' childbearing desires. We then conduct hazard modelling to predict pregnancy risk with variables based on interactions between the women's desires and their perceived partners' desires. Models based on perceived partners' desires perform better than one based on women's desires alone. The best model contains three significant predictors: one confirms the importance of pronatal, ambivalent, and indifferent desires for pregnancy risk; one indicates that the perceived partners' antinatal desires reduce the women's pregnancy risk; and one suggests that women who both perceive their partners accurately and are in agreement with them have a lower pregnancy risk. The results indicate that perceived partner data can improve prediction and enhance our understanding of pregnancy risk.

Keywords

childbearing desires; ambivalence; indifference; pronatalism; antinatalism; perception of partner; pregnancy risk; unplanned pregnancy; accuracy of perception; partner agreement

In a previous study of childbearing desires, Miller et al. (2013) developed a model based on the orthogonal interaction of positive and negative desires. They found that among 18 and 19 year old, unmarried women in sexual relationships, those whose desires were ambivalent (high positive and high negative), indifferent (low positive and low negative), and pronatal (high positive and low negative) were all at increased risk of an unplanned pregnancy compared to the great majority of women whose desires were antinatal (low positive and high negative) desires. However, a limitation of that study was its focus on the women's own desires to the exclusion of their perceptions of their partners' desires. In the current study, our goal is to correct that limitation.

Warren B. Miller, 229 Wixon Avenue, Aptos, CA 95003-4626, U.S.A. rennie@tfri.org, Cell phone: 650-814-2018.

In the research literature examining the effect of motivational ambivalence on pregnancy risk, there have been two main approaches with respect to gender. One involves collecting data only from women (for example: Frost et al. 2007; Schwartz et al. 2007; McQuillan et al. 2011; Sheeder et al. 2010) and the other involves collecting data from both women and men (for example: Layte et al. 2007; Higgins et al. 2012; Yoo et al. 2014). The latter approach fills part of the gap that results from the women only approach. However, because the women and men in these three studies were not couples, the extent to which ambivalence and related motivational complexes were a function of couple interaction could not be determined. There have been two less frequently pursued alternative approaches that deserve consideration. The first involves collecting data from both the women and men of a sample of couples. Two studies of contraceptive decision-making and use by couples (Miller and Pasta, 1996a; Kraft et al. 2010) are good examples of this approach. However, neither of these studies focused on ambivalence and related motivational complexes and we could not identify any others studies that did, very likely because of the difficulties and substantial costs involved in conducting large-scale couple studies. This leaves us with the second alternative approach, which involves collecting data from women only (or men only where appropriate) and asking them to report on their perceptions of their partners' childbearing desires. This approach is highly practical because it only necessitates the addition of one or two interview or questionnaire items to a standard survey. Unfortunately, this approach has been relatively unexplored, most likely because perceived partner data, especially those that require the respondents to make inferences about their partners' subjective states, are commonly thought of as overly confounded by respondents bias.

The data used in Miller et al.'s (2013) previous study are especially well suited to test this approach because the respondents' childbearing desires were measured weekly prospective to any pregnancy over a period of up to 2.5 years, thereby allowing an examination of the relationship between childbearing desires and subsequent pregnancy unaffected by retrospective bias. If perceived male partner pregnancy desires can be shown with these data to add predictive power, then that would suggest that standard surveys such as the National Survey of Family Growth in the U.S. could provide incremental information by incorporating perceived partner items into their format. Here we report the results of a study examining the additional explanatory power of women's perceptions of their sexual partners' pregnancy desires for the prediction of pregnancy risk. In addition, we explore which model of the data best serves that goal and what that model tells us about the couple processes involved.

Theoretical Framework

There have been many measurement approaches to the study of ambivalence as it is manifest in fertility behavior. Although many of these approaches have intuitive appeal, collectively they have two major drawbacks: first, different definitions across studies make it nearly impossible to compare studies; and second, researchers do not sufficiently anchor their measurement approach in a theoretical framework. Here we use the same theoretical framework used by Miller et al. (2013), one that is based on the orthogonal interaction of women's positive and negative desires. Figure 1 is a graphic representation of this interaction. A measure of *positive* childbearing desires is arranged in six rows and labeled on

the left side from 1 to 6, with increasing strength from top to bottom, and a measure of *negative* childbearing desires is arranged in six columns and labeled across the top from 1 to 6, with increasing strength from left to right. The interactions between the two oppositely valenced desires in this arrangement can be simplified by considering the figure's four quadrants, each with nine cells. The ambivalent quadrant includes those respondents who have the higher scores on both positive and negative desires and the indifferent quadrant includes those with the opposite pattern, lower scores on both desires. Similarly, the pronatal quadrant includes those respondents who have the higher scores on positive desires but the lower scores on negative desires, and the antinatal quadrant includes those with the opposite pattern, higher scores on negative desires and lower scores on positive desires.

The pole cells indicated in Figure 1 represent the most extreme scores for each quadrant. Over 91% of the observations in Miller et al. (2013) fell in the antinatal pole cell. Although this represents a large proportion of observations, the number of observations falling in each of the other quadrants was sufficient to predict an increased risk of pregnancy. In addition, when all of the non-pole cells of the antinatal quadrant were combined into a single variable, that group also demonstrated an increased risk of pregnancy, albeit somewhat smaller than that for the other three quadrants. Given these findings, we will use five quadrant-based variables (ambivalent, indifferent, pronatal, antinatal non-pole cell, and antinatal pole cell) in the study reported here.

Because we are concerned not just with our respondents' childbearing desires but with their perceptions of their partners' childbearing desires as well, we need to add a second theoretical component to our framework, one that deals with the psychological processes that underlie partner perceptions. There has been considerable previous theorizing and research that addresses this topic. Freud wrote about the defense mechanism of *projection*, which involves attributing unwanted desires or impulses to some other person as a way of disowning their origin in the self (Brenner 1957). The concept of *social projection* represents a parallel phenomenon that has been explored experimentally by social psychologists in recent decades. It has been described as using one's own dispositions as data to make quick predictions of what others are like or likely to do (Robbins and Krueger 2005) or as the tendency to project what one thinks one's own feelings would be in a given situation onto others (Boven and Loewenstein 2003). A closely related construct, one that has been described as the default response in the face of uncertainty, is *assumed similarity*, the tendency to assume others are similar to oneself (Watson et al. 2000; Lenton et al. 2007). Ames (2004a, 2004b) has developed a useful model of the process of *attribution* in which people make inferences about the attitudes of others in their social milieu based on their own attitudes if they perceive the others to be similar to themselves, and based on stereotypes if they perceive others to be different from themselves. In other words, they moderate their attribution processes using two different internal references depending on how similar to themselves they perceive others to be.

With one exception (Watson et al. 2000), an important limitation of this body of work is that much of it is laboratory based where respondents are asked to make judgments about people they do not know or know only casually. Our respondents were making ratings about an intimate partner, where factors like assumed similarity and stereotypes might be expected to

be much less important. We therefore base the component of our theoretical framework that addresses perception of partners' childbearing desires on a previous research study of reproductive partners' perceptions of each other's childbearing desires (Miller and Pasta 2006). That study was in turn based on a proposed theoretical framework for modelling the interaction of fertility motivations in couples (Miller, Severy, and Pasta 2004).

Figure 2 depicts the interaction between a female respondent's own desires, her perceptions of her partner's desires, and her partner's actual desires. The box on the left represents the respondent's consciousness and contains both her actual desires (solid lined circle) and her perception of her partner's desires (dashed line circle). The box on the right represents her partner's consciousness and contains his actual desires and his perception of her desires. In this case, because in this study we are not addressing his perception of her desires, we have faded that circle into the background of the figure.

There are three double-headed arrows in Figure 2, numbered 1, 2, and 3. These represent the degree of agreement or correspondence between a respondent's desires, her partner's desires, and her perception of her partner's desires. We refer to these as correspondence states. Arrow 1 represents *actual agreement* as indicated by the degree of correspondence between the respondent's desires and her partner's desires; arrow 2 represents *perceived agreement* as indicated by the degree of correspondence between the respondent's desires and her perception of her partner's desires; and arrow 3 represents *accuracy of perception* as indicated by the degree of correspondence between her perception of her partner's desires and his actual desires.

There are two single-headed arrows in Figure 2, numbered 4 and 5. These represent the two main processes that influence the respondent's perception of her partner's desires. Arrow 4 represents attribution whereby the respondent attributes her own desires to her partner. Arrow 5 represents apprehension (as in to apprehend, to grasp, or to correctly perceive) whereby the respondent correctly perceives her partner's actual desires. These two processes are of major importance in the current study because, as is implicit in Figure 2, they play a large role in determining perceived agreement and accuracy of perception, both of which we assume to be fundamental for the cooperation that is essential for couples in a sexual relationship in order to avoid an unplanned pregnancy.

In their 2006 study, Miller and Pasta used this framework to study data collected from 389 couples at five points in time over a five year period. They used hierarchical linear modelling (HLM) to examine how the accuracy of the wives' and husbands' perceptions of their spouses' childbearing desires (arrow 2 in Figure 2) varied not over time, but rather in relationship to the actual agreement between the two spouses (arrow 1 in Figure 2). Separate analyses were conducted on those couples who had children during the five year interval and those who did not. Here we focus on the childbearing group. The results were similar for both wives and husbands and indicated that there was a strong tendency for these respondents to perceive their spouses' desires either as highly similar to their own desires, i.e., guided primarily by a tendency to attribute their own desires to their spouses (arrow 4 in Figure 2), or as highly similar to their spouses' actual desires, i.e., guided primarily by a tendency to accurately apprehend their spouses' actual desires (arrow 5 in Figure 2).

Miller and Pasta then conducted additional HLM analyses of the respondents' characteristics that predicted a tendency toward attribution or apprehension. In the group of couples who had children during the five years, they found that those respondents who had experienced intense and/or conflicted interaction and communication about childbearing tended to have accurate apprehension of the spouse's desires. They also found that those respondents with high positive motivations for children and those who perceived their spouses as having a genial personality (and, by implication, less likely to express disagreement) tended to attribute their own desires to their spouses. Although these findings are based on married couples who were often interacting intensely about whether or not to have a planned pregnancy, we believe that they have relevance to the current study where the respondents are also involved in intimate relationships where the issue of whether and how to avoid an unplanned pregnancy is salient.

A similar framework was used by Kenny and Acitelli (2001) to explore the simultaneous measurement of accuracy and bias in the perception of a close partner. Unlike the Miller and Pasta framework that rested on psychological processes and correspondence states, their approach was built around the terminology associated with assumed similarity. What Miller and Pasta called attribution, they called bias, and what Miller and Pasta called apprehension, they called accuracy. In spite of these conceptual differences, the two frameworks have a great deal in common and Kenny and Acitelli's study of the feelings and perceived feelings of over two hundred dating and married couples produced results that were entirely congruent with Miller and Pasta's (2006) results. Their findings indicated that there was both bias and accuracy in all their couples' perceptions of each other in every feeling domain that they measured, that there were no gender differences in bias or accuracy, and that the bias effects were considerably stronger when the feeling domain was related to the couple's relationship, e.g., enjoyment of sex, as opposed to when it was not related to the relationship, e.g., job satisfaction.

Methods

Study design and sample

We use data collected during the Relationships Dynamics and Social Life (RDSL) study. These data were based on a random, population-based sample of 1,003 unmarried women aged 18–19 who resided in a single county in Michigan. Sixty minute, face-to-face baseline interviews were conducted from March 2008 through July 2009, focusing on family background, current and past friendships and sexual relationships, contraceptive use, pregnancy history and current desires. All interview respondents were also invited, and offered incentives, to participate in *a weekly journal-based, mixed-mode (internet and telephone) survey* that would track pregnancy status for 2.5 years. Cooperation rate was high: an 84% recruitment rate for the baseline interview, with 99% agreeing to participate in the survey and 75% participating for at least 18 months. We collected data from 992 respondents, who had completed 58,594 journals. For the present study, we excluded selected respondents as follows: 1) 90 respondents (9%) who had completed some or all of the first three journals but then dropped out of the study because three weeks was the look-back period from the time of pregnancy risk to the time when the respondents' desires were

measured; 2) 83 respondents (10%) who were never at risk of pregnancy (never in a relationship or always pregnant) or always married for all recorded journals; and, 3) 32 respondents (3%) who were missing their own or their partners' pregnancy desires scores. After these exclusions, the group remaining was comprised of 787 women who had completed 28,972 journals.

Measures

Core variables of pregnancy desires and perceived partner pregnancy desires

—Our two core variables of positive and negative childbearing desires were measured with the following two questions, after explaining that most people their age have both positive and negative feelings about getting pregnant and having a child:

> First, how much do you want to get pregnant with .....during the next month? Please give me a number between 0 and 5, where 0 means you don't at all want to get pregnant and 5 means you really want to get pregnant.
>
> And next, how much do you want to avoid getting pregnant with .....during the next month? Please give me a number between 0 and 5, where 0 means you don't at all want to avoid getting pregnant and 5 means you really want to avoid getting pregnant.

Our two other core variables of perceived partner positive and negative childbearing desires were measured with the following two questions about pregnancy desires:

> First, how much do you think .....wants you to get pregnant during the next month? Please give me a number between 0 and 5, where 0 means you think he doesn't at all want you to get pregnant and 5 means you think he really wants you to get pregnant.
>
> And next, how much do you think..... wants you to avoid getting pregnant during the next month? Please give me a number between 0 and 5, where 0 means you think he doesn't at all want you to avoid getting pregnant and 5 means you think he really wants you to avoid getting pregnant.

Quadrant-based variables and interaction variables

We created the variables that were used in our analyses in three steps. In the first step, we created five dichotomous, quadrant-based dummy variables for the respondents, corresponding to the categories in Miller et al. (2013) and based on Figure 1. Three dummy variables were based on all cases where the respondents' positive and negative childbearing desires fell respectively into the ambivalent, indifferent, and pronatal quadrants; a fourth dummy variable was based on all cases falling into the antinatal quadrant with the exception of the pole cell; and a fifth dummy variable was based on all cases falling into the pole cell of the antinatal quadrant. We refer to these five variables as the respondents' ambivalent, indifferent, pronatal, antinatal non-pole cell, and antinatal pole cell desires.

In the second step, we created five equivalent dichotomous, quadrant-based dummy variables for the respondents' perception of their partners. As above, three dummy variables were based on all cases falling into the ambivalent, indifferent, and pronatal quadrants; a

fourth dummy variable was based on all cases falling into the antinatal quadrant with the exception of the pole cell; and a fifth dummy variable was based on all cases falling into the pole cell of the antinatal quadrant. We refer to these as the perceived partners' ambivalent, indifferent, pronatal, antinatal non-pole cell, and antinatal pole cell desires.

In the third step, we interacted each of the respondents' five quadrant-based dummies with each of the perceived partner's five quadrant-based dummies in a twenty-five cell matrix, where each cell represented all women with a different unique combination of their own desires and perception of their partners' desires. We then used the twenty-five cell-based interaction variables, either unconstrained or constrained across different groups of cells as described below in the data analysis section, in the prediction of pregnancy risk.

Pregnancy—Each week 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 "1" for pregnant.

Control Variables—Descriptive statistics of a large number of respondents' background characteristics were measured at the baseline interview and are shown in Table 1. From these, we constructed control variables for the data analysis as follows: age (continuous variable); education (4 dummy variables, with four year college enrollment as the reference category); religious importance (two highest categories combined as a dummy variable); race (African American as a dummy variable); lived with biological parents during childhood (1and 2 combined as a dummy variable); age of biological mother at first birth (<20 as a dummy variable); mother's education (<high school graduate as a dummy variable); childhood public assistance (yes as a dummy variable); current public assistance (yes as a dummy variable); age at first sex (<16 as a dummy variable); number of sexual partners (>1 as a dummy variable); currently cohabiting (yes as a dummy variable); ever had sex without birth control (yes as a dummy variable); and number of pregnancies (1 and 2+ as separate dummy variables). Not shown in Table 1 are three final control variables. Months in study (mean =12.9, s.d. =8.41) and months in study squared (mean =231.8, s.d. =248.2) measure the length of the interval(s) a respondent has been at risk of pregnancy, thereby controlling for actual risk exposure. Number of journals (mean =91.1, s.d. =31.8) indicated the total number of observations a respondent had contributed to the data, thereby controlling for the effect of repeated measurement and the respondent's level of participation in the study.

Data analysis

Our analyses were conducted using Stata/SE, Version 12.1, Revision 23 January 2014 (www.stata.com). We estimated random effects, multi-level logit models in order to analyze the effects of pregnancy desires on pregnancies. We use logit models (regression models where the dependent variable is categorical) because the dependent variable is a 1/0 binary measure of a pregnancy occurring. We used multi-level models because we have multiple observations for each woman, with some covariates varying at the individual observation level and some varying only at the woman level. Finally, we used random-effects models to

allow the slopes and intercepts estimated by the model to vary across the individual respondents, thereby allowing the women-specific effects to be modeled. Because the data were precise to the week, we used discrete-time methods to estimate these models. Person-weeks of exposure were the units of analysis. We examined all pregnancies reported by each respondent and we included a time-varying control variable indicating the number of prior pregnancies. We considered women to be at risk of pregnancy during all weeks that they reported they were in a sexual relationship and not currently pregnant. Consequently, weeks in which a respondent was not in a relationship or was currently pregnant were excluded from the analyses.

Our time-varying measures of pregnancy desires and perceived partner pregnancy desires were measured three weeks prior to the first week a pregnancy was reported so that her desires would be measured prior to the sexual intercourse that had resulted in her pregnancy. In other words, all time-varying covariates were lagged by three weeks. We adopted this strategy to guard against reciprocal causation, in which a woman's discovery that she was pregnant affected how she reported her pregnancy desires.

We identified five theoretical models for the estimation of pregnancy risk from our measures of respondents' pregnancy desires and perceived partners' pregnancy desires. These included a *Noninteraction Model* in which the respondents' and the perceived partners' quadrant based dummy variables were not interacted in the prediction of risk, an *Unconstrained Interaction Model* in which the respondents' and the perceived partners' quadrant based dummy variables were interacted but remained unconstrained in the prediction of risk, and finally three additional models, each of which was interacted by imposing equality constraints on selected cells in the unconstrained model in order to form a small number of multi-cell variables. These three models included a *Constrained Respondents' Only Model*, a *Constrained Perceived Partners' Model*, and a *Constrained Attribution/Apprehension Model*.

A number of cells of the 25 cell interaction matrix contained no pregnancies (see Figure 3 in the Results section). Respondent-by-perceived partner interaction parameters for cells with no pregnancies correspond to maximum likelihood estimates of negative infinity on a logit scale, which represents a zero probability of pregnancy for women with the characteristics of the cells in question. The absence of any pregnancies for these cells resulted in a non-convergence of the model-fitting procedure for the unconstrained interaction model, making it necessary to drop it from further consideration [See Diamond et al (1986) for a fuller discussion of this issue.] The problem of non-convergence did not occur with our constrained interaction models, where parameters were constrained equal within a set of cells having at least one pregnancy. The four remaining models are fully described in the next section and the three constrained models are illustrated as well.

Results

Measures

Table 2 reports the descriptive statistics for the four core predictive measures of this study. Over 90% of the respondents' positive desires fall at the lowest score and over 90% of their

negative desires fall at the highest score. The equivalent percentile ranks for the respondents' perceived partners' positive and negative desires are both just under 89%. The table also shows the percentage of journal observations for each of the dummy variables of both the respondents' and the perceived partners' pregnancy desires. Between 1 and 5 percent of the respondents' own pregnancy desires fall in each of the ambivalent, indifferent, pronatal, and antinatal non-pole cells and between 1 and 4 percent of their perceived partners' desires fall in the same four cells.

Figure 3 shows the distribution of the number of person-weeks of observation, the number of respondents contributing to those observations, and the number of pregnancies reported for each of the twenty-five cells representing the interactions between the respondents' and perceived partners' quadrant-based dummy variables. It also provides marginal values for rows and columns of the interaction matrix. The overall totals in the bottom right corner indicate that almost twenty-nine thousand weekly observations by the respondents contributed to the study's data. The number of total respondents listed is larger than the 787 in the study because each cell reports the number of women contributing to its journal observations and pregnancies. Whenever a woman changes a desire or perceived partner desire, her data appears in a different cell, thereby increasing the count of women in the cell marginals. Note that a relatively large proportion of the observations fall in the diagonal running from the matrix's upper left to its lower right cells.

In arranging the quadrant categories along the top and left-hand side of Figure 3, we have placed the two columns representing the pole and non-pole antinatal quadrants on the right and the columns representing the other three quadrants on the left, with the pronatal quadrant on the far left. Although this arrangement may appear to be an ordinal one, it should not be interpreted as such. This is because the ambivalent and indifferent categories represent the two poles of a dimension that our theoretical framework posits is orthogonal, or largely so, to the antinatal/pronatal dimension. Thus not only do we not know the proper ordering of the ambivalence and indifference categories with respect to the two poles, but it is not clear that these two categories are properly located on the antinatal/pronatal dimension at all (see Miller et al., 2016 on this last point). It may turn out that subsequent research will show that the arrangement of the five quadrant variables we use in Figure 3 and subsequent figures is an appropriate ordinal variable for some purposes, but for the present we cannot make that assumption and future research may well show otherwise.

Models

Below we describe the results of estimating our four core models. We begin with a consideration of the different variable configurations in each model, together with the strength and standard errors of its coefficients. There follows a short section that describes the pattern of control variable results. We finish with a comparison of summary statistic measures of the four models.

Non-interaction Model—In estimating this model, we used four of the respondents' quadrant-based dummy variables and four of the perceived partners' quadrant-based dummy variables as predictors of pregnancy risk without any interactions between these variables

and omitted both the respondents' and perceived partners' anti-natal pole cell dummies as references. We included this model in order to provide a comparison with the subsequent interaction models and thereby allow a determination of whether those interactions improved model fit.

Of the eight quadrant based dummy variables in this model predicting the risk of pregnancy, four were significant. These were the respondents' pronatal dummy with a coefficient of 0.87* (SE = 0.39), the respondents' ambivalent dummy with a coefficient of 1.79*** (SE = 0.38), the respondents' Indifferent dummy with a coefficient of 1.76*** (SE = 0.48), and perceived partners' pronatal dummy with a coefficient of 0.99** (SE = 0.33), where the two-tailed p values are ***$p<0.001$, **$p<0.01$, and *$p<0.05$.

Constrained Interaction Models—The design of these three models was directed toward answering the question of whether the inclusion of perceptions of their partners' childbearing desires improves the prediction of pregnancy risk. This question is addressed most directly by comparing the constrained respondents' only model with the constrained perceived partner's model. However, the constrained attribution/apprehension model also addresses the question because it combines features of the first two, as well as including a variable that reflects perceived similarity on the part of the respondent.

An early step in the estimation of these three models was to explore which of three possible reference categories produced the best model fit: the respondents' antinatal, perceived partners' antinatal cell alone; the respondents' antinatal cells constrained together; or the respondents' antinatal and antinatal-np cells constrained together. A number of factors were taken into consideration. First, analysis results indicated that using any one of the three versions of the reference category produced essentially the same model fit in all three of the constrained interaction models describe below. Second, when the respondents' antinatal-np cells were constrained together as a separate variable from the respondents' antinatal cells, it was not significant. Third, when the respondents' antinatal-np cells were constrained together with the respondents' antinatal cells, model complexity relative to the other two potential reference categories was reduced. Given these considerations, we selected it this third option as the reference category for all three constrained interaction models.

Additional steps in the estimation of these models involved exploring whether slightly different versions of each one –achieved through slightly different constraints on the cells not included in the respondents' reference- produced better fits. The versions of the three primary models that we report here each produced the best fit with the lowest model complexity.

We estimated the Constrained Respondents' Only Model, using constraints that generated three predictor variables based, respectively, on the respondents' pronatal, ambivalent, and indifferent desires. The ambivalent desires variable was the strongest of the three predictors and the pronatal desires variable was the weakest.

We estimated the Constrained Perceived Partners' Model, using constraints that generated three predictor variables based, respectively on the perceived partners' pronatal desires

alone, the perceived partners' ambivalent and indifferent desires combined, and the perceived partners' two antinatal desires combined. In this case, the pronatal desires variable was the strongest predictor and the combined ambivalent/indifferent desires variable was the weakest.

We estimated the Constrained Apprehension/Attribution Model, using constraints that generated a single variable for all cells –other than the single cell representing both the respondents' and perceived partners' antinatal desires– where respondents' and perceived partners' desires are in agreement. This model also includes the same antinatal/antinatal-np variable present in the Constrained Perceived Partners' Model. In this case it is similar in strength to the apprehension/apprehension variable. Finally, this model includes a variable called the pronatal/ambivalent/indifferent disagreement variable, which is by far the strongest predictor. It is based on the pronatal, ambivalent, and indifferent cells of both the respondents and their perceived partners that are not included in the apprehension/attribution variable.

A unique feature of this model is the inclusion of the antinatal-np cell in the diagonal apprehension/attribution variable. The justification for doing this rests on three considerations: first, basing the Constrained Apprehension/Attribution Model on only three diagonal cells results in a model that has lower (poorer fitting) log likelihood; second, the antinatal-np cell is an outlier in terms of the number of pregnancies in the respondents' antinatal-np column; and third, including the antinatal-np cell in the apprehension/attribution variable applies the criterion of agreement between respondents and partners more completely.

Model Control Variables—Of the twenty-one control variables, the following five had significant positive coefficients: age at first sex 16 years or less**, one prior pregnancy**, two or more prior pregnancies*, months in study***, months in study, squared*; and the following two variables had significant negative coefficients: being a high school graduate * and number of journals***, where two-tailed p values are ***$p<0.001$, **$p<0.01$, and *$p<0.05$.

Model Selection Criteria—Table 3 shows two summary measures that serve as model selection criteria for the four primary models, including the log likelihood measure and the Akaike Information Criterion (AIC). The log likelihood measure indicates the goodness of fit of a model and allows comparison between models, with a less negative number indicating a better fit. Table 3 shows that the Non-interaction Model has the best log likelihood overall and that the Constrained Apprehension/Attribution Model has the best log likelihood of the three interaction models. The AIC is a measure of the quality of a model and is based, in part, on an estimate of the information lost when a given model is used to represent the phenomena under study. Thus it gives a reward for goodness of fit, but also gives a penalty for each additional parameter used in the model to achieve that fit, thereby balancing fit with parsimony. Table 3 shows that the Constrained Apprehension/Attribution Model is the best performing model on the basis of having the lowest AIC. However, the difference between it and both the Perceived Partner Model and the Non-interaction Model of about 1 point is relatively small. The Constrained Respondents' Only Model is the worst

performing model and the difference between it and the other three models of 3 to 4 points is more substantial. The Non-interaction Model, which is best fitting on the basis of the log likelihood measure, has paid a large penalty for its numerous parameters and is essentially on a par with the Constrained Perceived Partner Model.

Discussion

The question posed in the title of this paper and its introductory paragraphs is whether including respondents' perceptions of their partners' pregnancy desires in survey research will increase our ability to predict pregnancy risk. It is therefore noteworthy that in the current study all three of the best performing models as judged by the Akaike Information Criterion have perceived partner variables and the worst performing model is the one based solely on the respondents' desires. This finding provides good supporting evidence for the inclusion of perceived partner desires in data collection efforts focused on the prediction of unplanned pregnancies, especially when the concern is with ambivalence and related motivational phenomena.

More specifically, our findings indicate that the Constrained Apprehension/Attribution Model is the best performing one among the three models that included perceived partner variables. However, the closeness of these three models on the AIC measure, together with the failure of our sample to fill every cell of the interaction matrix with at least one pregnancy, means that there could well be changes in the rank order of these models with subsequent studies, especially ones that involved respondents with different demographic characteristics, such as married couples, older couples, those with higher educational achievement, with more income, or from different subcultural groups. This means that all three models should be kept in mind during future research. With that note of caution in mind, it is worth considering what the top three models together suggest about the specific perceived partner desires that effect pregnancy risk.

The Non-interaction Model indicates that the cells in the perceived partners' pronatal dummy are the only ones that add explanatory power above that provided by three of the respondents' dummies. Intuitively it makes sense that having a pronatal partner might add to respondents' risk of pregnancy. In contrast, the Constrained Perceived Partners' Model indicates that all three variables representing the perceived partner's desires contribute to pregnancy risk. However, because that model's perceived partners' pronatal desires variable has the strongest coefficient compared to its other two variables, it provides modest support for the pronatal findings of the Non-interaction Model, while also indicating effects of the two other types of perceived partners' desires. Finally, the variable with the strongest coefficient in the Constrained Apprehension/Attribution Model is based on a cluster of pronatal, ambivalent, and indifferent cells that represent disagreement between respondents and their perceived partners. Because only two of the six cells in this variable reflect perceived partners' pronatal desires, this model can be said to provide only slight support for the perceived pronatalism in the first two models.

Because the Constrained Apprehension/Attribution Mode has a more complex pattern, one in which the variable definitions are based on *either agreement or disagreement*, it and its

three variables require further consideration. As noted, respondents who fall in the pronatal/ambivalent/indifferent disagreement variable are at the highest pregnancy risk, probably as a result of two main factors: the respondents' and perceived partners' high-risk cells themselves (reflecting the findings of Miller et al., 2013), together with the respondents' *perception of disagreement* between themselves and their partners. In comparison, the respondents who fall in the antinatal/antinatal-np variable have a lower pregnancy risk, one where only the respondents' high risk cells are involved, together with the respondents' *perception of disagreement*. This lower risk presumably occurs because of the restraining effects of the perceived partners' antinatalism. Finally, respondents who fall in the apprehension/attribution variable also have a lower pregnancy risk. In this case both the respondents' and perceived partners' high risk cells are involved, together with the respondents' *perception of agreement*. This raises the question as to what might account for the lower risk of the apprehension/attribution variable. Although it includes the antinatal-np/antinatal-np cell, the data for that cell (see Figure 3) do not differ sufficiently from those of the variable's other three cells to suggest an appreciable contribution to the lowering of risk.

One answer to the question would be that the apprehension/attribution variable is simply based on assumed similarity, the default response used under conditions of uncertainty about what a partner feels. This interpretation would certainly be consistent with the large number of cases that fall along the diagonal (see Figure 3) because of the large role that assumed similarity is believed to play in moderating judgments about another person's inner states (Kenny and Acitelli 2001; Lenton 2008). However, the assumed similarity explanation would seem unlikely to account for the observed risk-reduction effect given the predominantly high risk cells that are included in the attribution/apprehension variable. Our model of correspondence states and influence processes shown in Figure 2 suggests an alternative way of thinking about the possible risk-reduction factor.

Recall that the results of the Miller and Pasta (2006) study of married couples indicated that there was a strong tendency for those respondents either to have an accurate apprehension of their spouses' desires or to attribute their own desires to the spouses. In spite of the potential limitations inherent in drawing parallels between married and unmarried couples, we suggest that these attributional tendencies are reasonably likely to be present in the women of the current study, especially given the comparable level of sexual intimacy in the samples of the two studies and the attendant decision-making that this intimacy requires. If we make this assumption, then based on the Miller and Pasta study it is likely that a subgroup of women in the current study accurately apprehended their partners' desires and another subgroup attributed their own desires to their partners. We further suggest that it is the accurate perception of their partners by this first subgroup that interacts with the agreement they have about their respective desires that produces the risk-reduction effect observed in the attribution/apprehension variable. It is not possible from the current study to be certain about this conclusion or to say how large this accurately perceiving first subgroup is likely to be; that will require further research that includes gathering data from the perceived partner. However, given the results of the Miller and Pasta study, it may well be large enough to reduce the coefficient of the attribution/apprehension variable, even if all the remaining respondents were mistakenly attributing their partners' desires on the basis of either their own disposition or a default assumed similarity.

The reason for the risk-reduction effect created in the subgroup of women with accurate perceptions of their partner may be understood as resulting from an interaction between accuracy and agreement. There is ample research that demonstrates the disruptive effect on effective contraceptive use and unplanned pregnancy prevention of motivational disagreement between the members of a sexually intimate couple (Miller and Pasta 1996b; 2001). In the current study the best performing model has three predictor variables, two of which are based on a perceived disagreement between the women and their partners on childbearing desires, and only one of which –the attribution/apprehension predictor– is based on perceived agreement. All three of these variables are undoubtedly affected by attributional distortions but only in the attribution/apprehension predictor is there perceived agreement and therefore it is only in that predictor that the possibility of interaction between accuracy and perceived agreement occurs. There may be actual agreement between respondents and partners for a subset of cases falling in any of the cells above or below the diagonal, but because none of the cases in that subset involves perceived agreement on the part of the respondents, there can be no interaction between accuracy and perceived agreement.

The answer to why accuracy and perceived agreement interact to reduce pregnancy risk also requires additional research. However, whether the perceived agreement is about being pronatal, ambivalent, indifferent, or just weakly antinatal, we suggest that the respondents and their partners have similar motivational profiles disposing them to the behaviors that risk pregnancy. Further, we believe that accuracy means that the respondents correctly perceive that situation and are likely to be confident about their perceived agreement. As described in the Miller and Pasta (2006) study, this confidence either results from an honest discussion or leads to such a discussion. In either case, the couple is better enabled to understand each other and cooperate in the avoidance of risky behavior as a result of it.

We conclude that there is good support for the premise that women’s perceptions of their partners’ childbearing desires contains important information that can enhance our understanding of the factors contributing to their pregnancy risk and thereby potentially improve our ability both to predict it and to provide useful services to those at risk. In addition to the need for confirmatory studies, there is a need for future research that will focus on what factors covary with the predictors that we have identified, especially those present in the Constrained Attribution/Apprehension Model, thereby allowing us to gain insights into their determinants and consequences. We also encourage the adoption of separate questions about positive and negative childbearing desires by those who design and conduct survey research in order to facilitate further studies of the interesting and potentially important way that these two motivational forces interact with each other while steering our behavior.

Acknowledgments

This research was supported by two grants from the National Institute of Child Health and Human Development (R01 HD050329, R01 HD050329-S1, PI Barber), a grant from the National Institute on Drug Abuse (R21 DA024186, PI Axinn), and a population center grant from the National Institute of Child Health and Human Development to the University of Michigan’s Population Studies Center (R24 HD041028).

The authors gratefully acknowledge the Survey Research Operations (SRO) unit at the Survey Research Center of the Institute for Social Research for their help with the data collection, particularly Vivienne Outlaw, Sharon Parker, and Meg Stephenson. The authors also gratefully acknowledge the intellectual contributions of the other members of the original RDSL project team, William Axinn, Mick Couper, Steven Heeringa, Heather Gatny, and Yasamin Kusunoki, as well as the Advisory Committee for the project: Larry Bumpass, Elizabeth Cooksey, Kathie Harris, and Linda Waite. We also greatly appreciate the statistical consultation of David J. Pasta, Vice President, Medical Affairs Statistical Analysis, ICON Biostatistics & Programming

References

Ames, Daniel R. Inside the mind reader's tool kit: Projection and stereotyping in mental state inference. Journal of Personality and Social Psychology. 2004a; 87(3):340–353. [PubMed: 15382984]

Ames, Daniel R. Strategies for social inference: A similarity contingency model of projection and stereotyping in attribute prevalence estimates. Journal of Personality and Social Psychology. 2004b; 87(5):573–585. [PubMed: 15535772]

Brenner, Charles. An Elementary Textbook of Psychoanalysis. New York, NY: Doubleday; 1957.

Boven L, Loewenstein George. Social projection of transient drive states. Personality and Social Psychology Bulletin. 2003; 29(9):1159–1168. [PubMed: 15189611]

Diamond, Ian D., McDonald, John W., Shah, Iqbal H. Proportional hazard models for current status data: Application to the study of differentials in age at weaning in Pakistan. Demography. 1986; 23(4):607–620. [PubMed: 3803657]

Frost, Jennifer J., Singh, Susheela, Finer, Lawrence B. Factors associated with contraceptive use and nonuse, United States 2004. Perspectives on Sexual and Reproductive Health. 2007; 39(2):90–99. [PubMed: 17565622]

Higgins, Jenny A., Popkin, Ronna A., Santelli, John S. Pregnancy ambivalence and contraceptive use among young adults in the United States. Perspectives on Sexual and Reproductive Health. 2012; 44(4):236–243. [PubMed: 23231331]

Kenny, David A., Acitelli, Linda K. Accuracy and Bias in the perception of the partner in a close relationship. Journal of Personality and Social Psychology. 2001; 80(3):439–448. [PubMed: 11300577]

Kraft, Joan Marie, Marie Harvey, S., Timajchy, Kendra Hatfield, Beckman, Linda, Farr, Sherry L., Jamieson, Denise J., Thorburn, Sheryl. Pregnancy motivations and contraceptive use: Hers, his, or theirs? Women's Health Issues. 2010; 20(4):234–241. [PubMed: 20620912]

Layte, Richard, McGee, Hannah, Rundle, Kay, Leigh, Colette. Does ambivalence about becoming pregnant explain social class differentials in use of contraception? The European Journal of Public Health. 2007; 17(5):477–482. [PubMed: 17185329]

Lenton, Alison P., Bryan, Angela, Hastle, Reid, Fischer, Oliver. We want the same thing: Projection in judgments of sexual intent. Personality and Social Psychology Bulletin. 2007; 33(7):975–988. [PubMed: 17554012]

McQuillan, Julia, Greil, Arthur L., Shreffler, Karina M. Pregnancy intentions among women who do not try: Focusing on women who are okay either way. Maternal and Child Health Journal. 2011; 15(21):178–187. [PubMed: 20449643]

Miller, Warren B., Pasta, David J. The relative influence of husbands and wives on the choice and use of oral contraception, a diaphragm, and condoms. Journal of Applied Social Psychology. 1996a; 26(19):1749–1774.

Miller, Warren B., Pasta, David J. Couple disagreement: Effects on the formation and implementation of fertility decisions. Personal Relationships. 1996b; 3:307–336. [PubMed: 12320602]

Miller, Warren B., Pasta, David J. Motivational antecedents to contraceptive method change following a pregnancy scare: A couple analysis. Social Biology. 2001; 48(3–4):256–277. [PubMed: 12516227]

Miller, Warren B., Pasta, David J. Bias toward self in the perception of spouse's childbearing desires. 2006.

Miller, Warren B., Severy, Lawrence J., Pasta, David J. A framework for modeling fertility motivation in couples. Population Studies. 2004; 58(2):193–205. [PubMed: 15204253]

Miller, Warren B., Barber, Jennifer S., Gatny, Heather H. The effects of ambivalent fertility desires on pregnancy risk in young women in the USA. Population Studies. 2013; 67(1):25–38. [PubMed: 23234316]

Miller, Warren B., Jones, Jo, Pasta, David J. An implicit ambivalence-indifference dimension of childbearing desires in the National Survey of Family Growth. Demographic Research. 2016; 34(7):203–242.

Robbins, Jordan, Krueger, Joachim I. Social projection to in-groups and out-groups: A review and meta-analysis. Personality and Social Psychology Review. 2005; 9(1):32–47. [PubMed: 15745863]

Schwarz, Eleanor Bimla, Lohr, Patricia A., Gold, Melanie A., Gerbert, Barbera. Prevalence and correlates of ambivalence towards pregnancy among nonpregnant women. Contraception. 2007; 75(4):305–310. [PubMed: 17362711]

Sheeder, Jeanelle, Teal, Stephanie B., Crane, Lori A., Stevens-Simon, Catherine. Adolescent childbearing ambivalence: Is it the sum of its parts? Journal of Pediatric and Adolescent Gynecology. 2010; 23(2):86–92. [PubMed: 19734075]

Watson, David, Hubbard, Brock, Wiese, David. Self-other agreement in personality and affectivity: The role of acquaintanceship, trait visibility, and assumed similarity. Journal of Personality and Social Psychology. 2000; 78(3):546–558. [PubMed: 10743880]

Yoo, Sam Hyun, Guzzo, Karen Benjamin, Hayford, Sarah R. Understanding the complexity of ambivalence toward pregnancy: Does it predict inconsistent use of contraception? Biodemography and Social Biology. 2014; 60(1):49–66. [PubMed: 24784987]

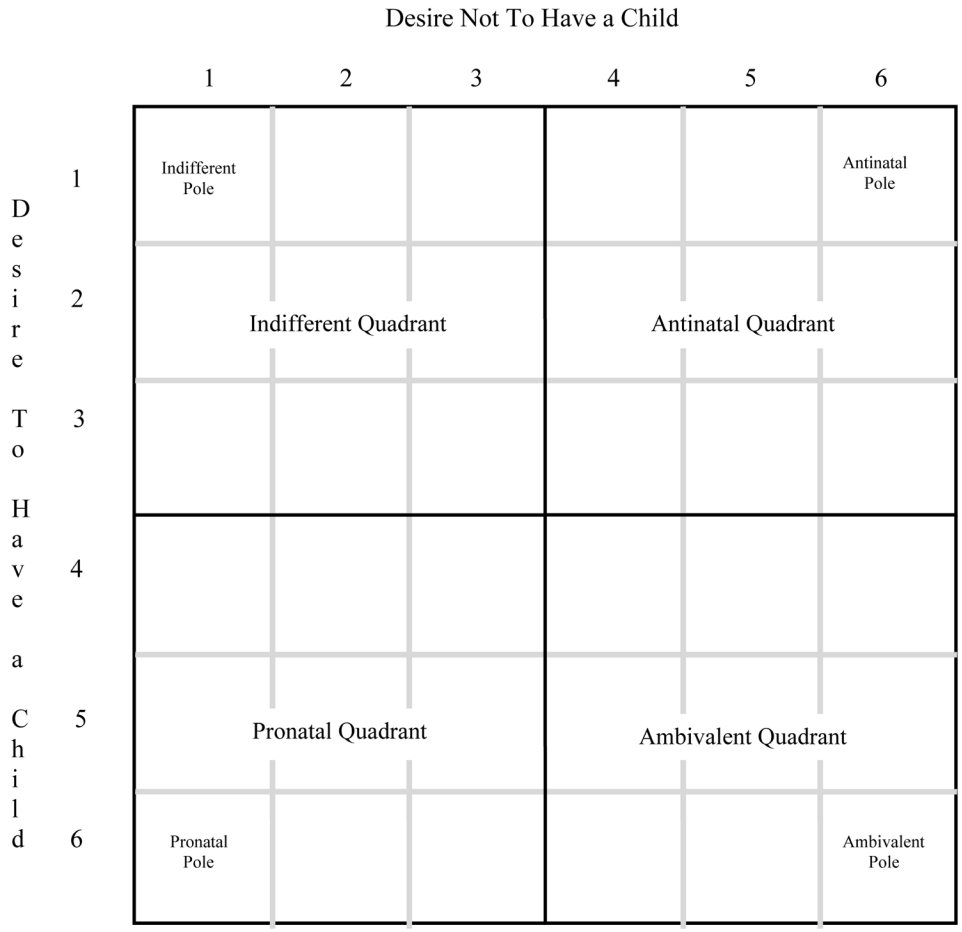

Figure 1.

A graphic representation of the interaction between two unipolar dimensions of childbearing desires, one positive and the other negative, both varying from 1 to 6. Source: Miller, Barber, and Gatny, 2013.

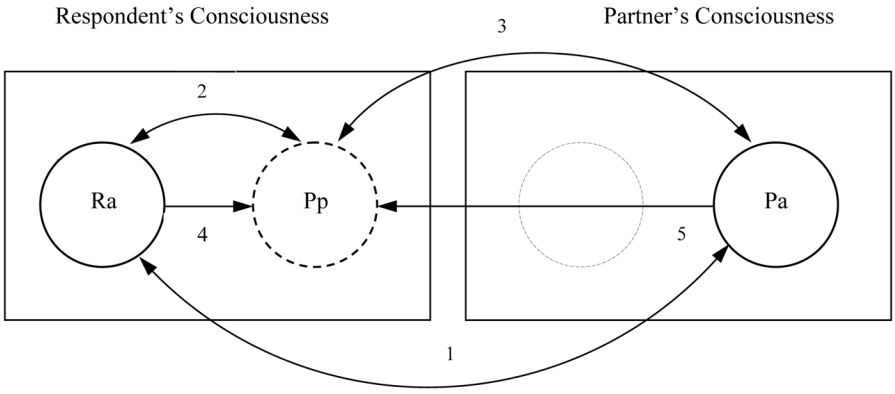

Figure 2.

A schematic representation of two types of relationships between a respondent's actual desires (Ra), her partner's actual desires (Pa), and a respondent's perception of her partner's desires (Pp). The double-headed arrows represent three correspondence states: 1. actual agreement, 2. perceived agreement, and 3. accuracy of perception. The by single-headed arrows represent two influence processes: 4. attribution and 5. apprehension. Adapted from Miller and Pasta, 2006.

Respondents' Dummy Variables

Perceived Partners' Dummy Variables	Pronatal	Ambivalent	Indifferent	Non-Polar Antinatal	Polar Antinatal	
Pronatal	753/102/17	144/44/10	31/20/2	112/43/1	370/116/6	1,410/325/36
Ambivalent	57/35/1	508/76/9	10/7/1	42/30/0	277/77/4	894/225/15
Indifferent	30/13/0	10/6/0	141/62/5	22/11/0	119/67/0	322/159/5
Non-Polar Antinatal	79/16/1	92/19/1	4/4/0	381/74/4	257/86/0	813/199/6
Polar Antinatal	117/40/2	87/46/4	62/50/1	166/58/0	25,101/737/84	25,533/931/91
	1,036/206/21	841/191/24	248/143/9	723/216/5	26,124/1,083/94	28,972/1,839/153

Figure 3.

Frequency distribution of the number of journal observations/number of respondents contributing to those observations/number of pregnancies for each cell in the respondents-by-perceived partners interaction matrix.

Source: Relationship Dynamics and Social Life study.

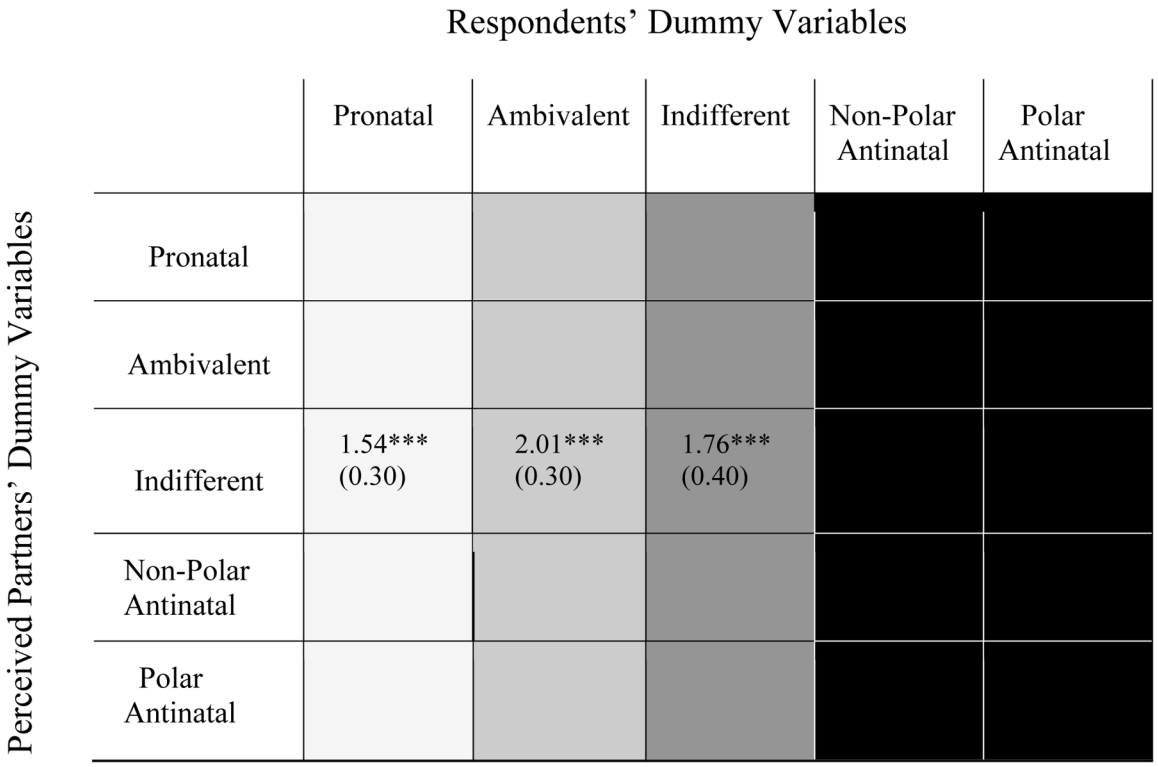

Figure 4.

The constrained respondents' only model, showing the coefficients (SEs) of the three variables predicting pregnancy risk. The cells constrained together to form each of the three predictor variables are indicated with distinct background shadings and the cells constrained together as the reference are indicated in black.

***p < 0.001 (two-tailed test).

Source: Miller, Barber, and Gatny, 2013

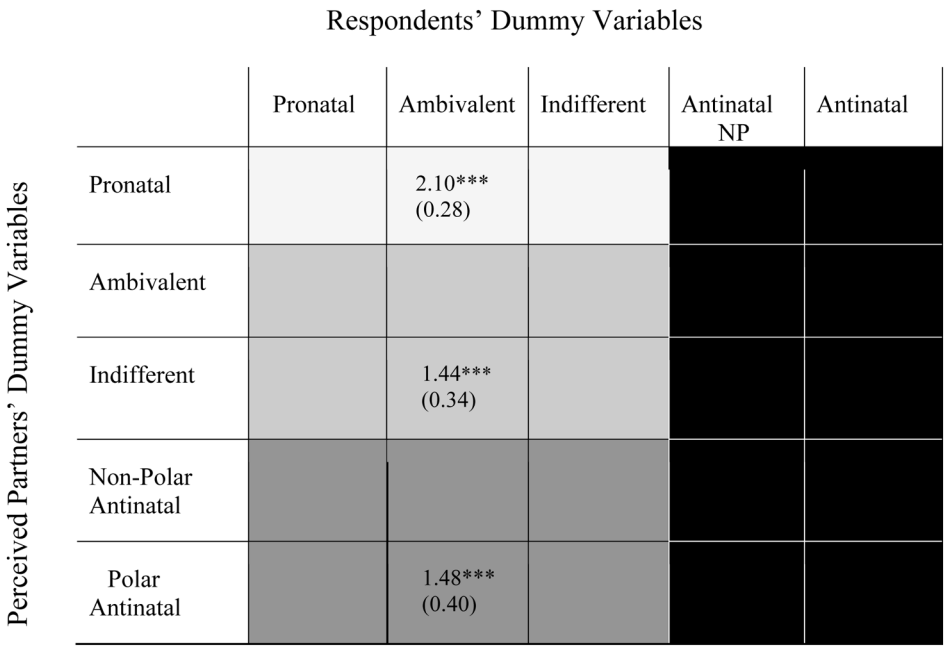

Figure 5.

The constrained perceived partners' model, showing the coefficients (SEs) of the three variables predicting pregnancy risk. The cells constrained together to form each of the three predictor variables are indicated with distinct background shadings and the cells constrained together as the reference are indicated in black.

***p<0.001 (two-tailed test)

Source: Miller, Barber, and Gatny, 2013

Table 1

Descriptive statistics of the measures of respondents' characteristics used as control variables in the analyses. N=28,972 journal observations from 787 young women.

Characteristic		Characteristic	
Category	**Frequency**	**Category**	**Frequency**
Age		*Mother's Education*	
18	330	< High School	68
19	390	High School Graduate	253
20	67	Some College	263
		BA and > BA	173
Education		Refused, Don't Know, Missing	30
High School Drop-Out	59		
Enrolled in High School	99	*Received Childhood Public Assistance*	
High School Graduate	223	Yes	284
Enrolled in 2 Year College or Voc. Sch.	185	No	481
Enrolled in 4 Year College	221	Refused, Don't Know	22
Religious Importance		*Currently Receiving Public Assistance*	
Not Important	80	Yes	199
Somewhat Important	262	No	284
Very Important	275		
More Important than Anything	170	*Age at First Sex*	
		< 15	120
Race		15–16	281
African American	264	17–19	215
White	496	Never	169
Other	20	Refused, Don't Know	2
Refused, Don't Know, Missing	7		
		Total Number of Lifetime Sexual Partners	
Lived mostly with parents during childhood		1	140
Yes, two biological or adoptive parents	364	2–3	211
Yes, one biological and one step-parent	49	4–6	153
Yes, one biological parent only	184	> 6	108
No, other	190	None	162
		Refused, Don't Know	13
Age of biological mother at first birth			
< 18	133	*Currently Cohabiting*	
18–19	147	No	120
20–24	276	Yes	488
25–30	155	No current partner	179
> 30	52		
Refused, Don't know	24		
Ever had sexual intercourse without birth control		*Number of Pregnancies*	

Characteristic		Characteristic	
Category	**Frequency**	**Category**	**Frequency**
Yes	333	0	592
No	238	1	135
Missing	216	2	35
		> 2	25

Source: Relationship Dynamics and Social Life study.

Table 2

Descriptive statistics of measures of pregnancy desires used in the analyses (N=28,972 journal observations from 787 young women)

Frequency Distributions of Core Measures	**Low Desires**					**High Desires**
	1	**2**	**3**	**4**	**5**	**6**
Respondents' Desires						
Desires to Become Pregnant (positive desires)	26,267	477	351	982	342	553
Desires to Avoid Pregnancy (negative desires)	622	237	425	856	632	26,200
Perceived of Partners' Desires						
Desires to Become Pregnant (positive desires)	25,687	529	452	967	447	890
Desires to Avoid Pregnancy (negative desires)	925	278	529	986	637	25,617
Quadrant-based Dummy Variables						
As Percentage of Journal Observations						

	%		%
Respondents' Desires		*Perceived Partner's Desires*	
Pronatal Dummy	3.58	Pronatal Dummy	4.87
Ambivalent Dummy	2.90	Ambivalent Dummy	3.09
Indifferent Dummy	0.86	Indifferent Dummy	1.11
Antinatal Non-Pole-Cells Dummy	2.50	Antinatal Non-Pole-Cells Dummy	2.81
Antinatal Pole-Cell Dummy	90.17	Antinatal Pole-Cell Dummy	88.13

Source:Relationship Dynamics and Social Life study.

Table 3

Summary measures for the four primary models. N = 28,972

Primary Models	Log Likelihood	AIC
Non-interaction	808.18	1,676.36
Constrained Interaction		
Respondent Only	814.79	1,679.58
Perceived Partner	813.35	1,676.70
Attribution/Apprehension	812.69	1,675.38

Source: Relationship Dynamics and Social Life study