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Predictive Ability and Stability of Adolescents' Pregnancy Intentions in a Predominantly Latino Community

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Abstract

Using data from a prospective cohort of 555 adolescent girls and boys from a predominantly Latino neighborhood of San Francisco, we examined how well four survey questionnaire items measuring pregnancy intentions predicted the incidence of pregnancy. We also compared consistency of responses among items and assessed how intentions fluctuated over time. Girls experienced 72 pregnancies over two years (six-month cumulative incidence = 8 percent), and boys reported being responsible for 50 pregnancies (six-month cumulative incidence = 10 percent). Although the probability of becoming pregnant generally increased with higher intention to do so, the risk of becoming pregnant was elevated only at the highest response categories for each item. Most pregnancies occurred among teenagers reporting the lowest levels of intention: for instance, 73 percent of pregnancies occurred among girls who reported that they definitely did not want to become pregnant. Considerable change in respondents' intentions were found over short periods of time: 18 percent and 41 percent of responses to the wantedness and happiness items, respectively, changed between six-month survey visits. The development of appropriate strategies to reduce pregnancy among adolescents would benefit from a more nuanced understanding of how teenagers view the prospect of pregnancy and what determines whether they actively protect themselves from unintended pregnancy.

Although the pregnancy rate among teenagers has declined in the United States since its peak in 1990, the incidence of pregnancy remains high among the young, particularly among racial and ethnic minority groups. Latina adolescents experience nearly three times more pregnancies (126.6/1,000 person-years [PY] among those aged 15–19 in 2006) than non-Latina whites (44.0/1,000 PY) and approximately the same number as blacks (126.3/1,000 PY) (Kost et al. 2010). Although the reasons for the higher pregnancy rate among Latina adolescents are not fully understood, several factors related to social disadvantage and cultural norms are believed to contribute to these rates. For instance, migration and lower

socioeconomic status may result in decreased access to reproductive health services and in family instability, both of which are associated with increased incidence of pregnancy (Driscoll et al. 2001; Frost and Driscoll 2006). Cultural norms, such as those governing what is considered appropriate behavior for each sex regarding sexual and contraceptive decision making, are also likely to influence the occurrence of pregnancy (Pulerwitz et al. 2000; Driscoll et al. 2001; Gilliam 2007).

Greater desire for children among Latino than non-Latino adolescents is thought to account, in part, for their higher pregnancy rates. Data from the 2002 National Survey of Family Growth (NSFG) indicate that 10 percent of Latina teenaged girls would be “very pleased” if they became pregnant, double the proportion of non-Latina black teenagers (5 percent) and non-Latina white teenagers (4 percent) (Abma et al. 2004). This pattern holds for male teenagers as well: 10 percent of Latinos, 1 percent of non-Latino blacks, and 6 percent non-Latino whites report that they would be “very pleased” to make a girl pregnant (Abma et al. 2004). Other studies examining adolescent pregnancy intentions have found more positive attitudes toward pregnancy among blacks as well as Latinos (Cowley and Farley 2001; Jaccard et al. 2003; Rosengard et al. 2004; Heavey et al. 2008). Quantitative data are supported by ethnographic studies, which suggest that Latino culture can be highly supportive of early motherhood and that some Latina girls may feel that becoming pregnant wins them respect from their community (Oropesa 1996; Unger and Molina 1998). Latino boys may also hold gender-role attitudes in which their identity is emotionally tied to fathering children (Goodyear et al. 2000; Adler and Rogers 2008).

Although Latino adolescents are more likely than non-Latinos to view becoming pregnant in a positive light and are also more likely to become pregnant, little is known about the extent to which positive intentions are predictive of subsequent pregnancy (Santelli et al. 2003). To date, studies of adults in the United States have yielded mixed results regarding the predictive value of pregnancy intentions (Westoff and Ryder 1977; Miller and Pasta 1995; Schoen et al. 1999; Williams et al. 1999; Quesnel-Vallée and Morgan 2004), as have the few studies of adolescents. A study using representative data on ninth to eleventh graders from the National Longitudinal Study of Adolescent Health ($n = 4,869$) examined whether two measures of negative attitudes toward pregnancy (measured prospectively) were associated with a reduced risk of pregnancy in the 10–12 months subsequent to the survey (Jaccard et al. 2003). The authors found that less favorable attitudes toward pregnancy were associated with a lower risk of pregnancy, with an approximate average decrease in odds of 36 percent per level on a five-point scale (Jaccard et al. 2003). Another study using data from that survey—a multivariable analysis of only those respondents reporting being sexually experienced ($n = 1,415$)—found, however, that a scale of five items measuring negative attitudes toward pregnancy did not predict pregnancy (Bruckner et al. 2004). Subgroup analyses by ethnicity were not conducted in these studies. Another study of sexually active teenagers in California found that girls who both were planning to become pregnant and thought that pregnancy was likely were four times more likely to become pregnant than those who neither wanted to become pregnant nor thought that they were likely to do so (Rosengard et al. 2004). We are aware of no study that has examined the association between intentions and pregnancy among boys, despite a growing recognition that male intentions play a critical role in females’ risk of pregnancy (Cowley and Farley 2001; Dudgeon and Inhorn 2004; Gilliam 2007).

One of the largest impediments to examining the role of pregnancy intentions among adolescents is a lack of agreement about how the term “intentions” is defined and measured. Traditional measures have been criticized for several reasons. Although a growing literature documents that individuals hold a range of attitudes toward becoming pregnant, including ambivalent or conflicted feelings (Stevens-Simon et al. 1996; Bachrach and Newcomer

1999; Barrett and Wellings 2002; Kendall et al. 2005), many studies measure a single aspect of intentionality, such as the degree to which a pregnancy was planned or correctly timed or how happy a woman was upon becoming pregnant (Klerman 2000). Some studies, including those using Demographic and Health Survey (DHS) data, continue to categorize pregnancies simply as wanted, unwanted, or mistimed (Finer and Henshaw 2006; USAID and Macro International 2008). Although this method of categorization can be valuable for assessing group differences in intentions or time trends, it may lead to substantial misclassification in terms of individual intentions. Aside from capturing only narrow dimensions of intentions, such measures are especially inappropriate for teenagers, who may be less likely to plan or time pregnancies consciously. Classifications that are based on a woman's lifetime reproductive goals are also inappropriate for teenagers, who are less likely to have clearly defined fertility objectives (Kaufmann et al. 1997; Luker 1999; Lindberg et al. 2008).

In addition, most studies assess intentionality retrospectively, asking women to recall their intentions after their pregnancy has occurred. Because a woman's feelings toward conception are likely to change, such retrospective measures may reflect inaccurate recollections of past emotions, or emotions that arose after learning about the pregnancy or after giving birth (Bachrach and Newcomer 1999). In fact, emotions concerning a pregnancy have been shown to change both over the course of the pregnancy and following the birth of the child, although studies have yielded mixed findings regarding such changes in intentions (Joyce et al. 2000; Poole et al. 2000; Barrett et al. 2004). Few studies have quantified the stability of intentions among nonpregnant women (Bankole and Westoff 1998; Roy et al. 2008), and even these studies focus on the stability of intended completed family size among married women. No study of which we are aware has quantified the stability of short-term reproductive intentions among adolescents. An assessment of pregnancy intentions shortly prior to the occurrence of pregnancy is likely to be more appropriate for teenagers, whose intentions may change over time and with changes in school, activities, and relationships (Zabin et al. 2000).

This analysis of pregnancy intentions and pregnancy among adolescents living in a predominantly Latino neighborhood in San Francisco, California, addresses several methodological and substantive gaps in the growing literature on pregnancy intentions. Specifically, we use four items to characterize adolescent males' and females' pregnancy intentions prospectively over a two-year period. We examine the consistency of responses to these intentions questions and describe the stability of teenagers' pregnancy intentions over time. Finally, we assess how well intentions, as well as changes in intentions, predict subsequent pregnancy. A richer understanding of teenagers' attitudes and ambivalence toward pregnancy prior to conception and whether their intentions predict pregnancy will be valuable for shaping clinical protocols to assess pregnancy risk, determining the extent to which adolescents are able to carry through with desired intentions, and developing appropriate pregnancy-prevention strategies for them, particularly in Latino communities. Results may also inform the development of improved measures of intentions and the unmet need for contraception, which would help clarify mixed findings regarding the impact of intentions on infants' and parents' health (Gipson et al. 2008) and shed light on debates regarding the degree to which adolescents' fertility falls under conscious control (Luker 1975; O'Donoghue and Rabin 2000; Esacove 2008; Johnson-Hanks 2008).

Methods

This analysis uses data from the Mission Teen Health Project (MTHP), a prospective cohort study designed to examine the effect of sexual and peer networks on adolescents' sexual behavior and risk of sexually transmitted infections (STIs) and pregnancy. Methods of the study, conducted from 2001–04, have been described in detail elsewhere (Minnis et al. 2002

and 2008; Doherty et al. 2007). Briefly, 258 male and 297 female adolescents aged 15–19 were recruited¹ from community locations and street venues in the predominantly Latino Mission District, a neighborhood that serves as a cultural and residential center for San Francisco’s Latino community. Purposive, venue-based sampling was used to recruit hard-to-reach teenagers, who are less likely to seek clinical services and attend school. Recruitment locations were selected based on rigorous qualitative work that included focus-group meetings, in-depth interviews with teenagers living in the Mission District (Auerswald et al. 2004), and brief quantitative interviews to estimate venue yield. Additional participants were recruited through community centers and by referral from participants. Eligibility criteria included: fluency in English or Spanish, intention to live in the San Francisco Bay Area for the next two years, and willingness to obtain parental consent if the participant was a minor. The boys and girls in the sample were not necessarily sex partners.

Adolescents who agreed to participate (and, in the case of minors, for whom parental consent was obtained) underwent a baseline survey, which was randomly determined to be administered either by a trained interviewer or by audio computer-assisted self-interview (ACASI). Surveys collected information about the respondents’ intention to become pregnant (for girls) or to make a partner pregnant (for boys) in the next six months. Information about respondents’ sociodemographic background and sexual history and behaviors was also collected. Every six months for the following two years, participants completed an in-person study visit that included an interview, again conducted either by an interviewer or with ACASI, containing the same intentions questions. At each follow-up visit, participants were asked whether they had become pregnant or made anyone pregnant in the previous six months. All female participants also provided a urine specimen for pregnancy testing regardless of self-reported pregnancy status.² Participants who tested positive for pregnancy were offered comprehensive pregnancy options (prenatal care, abortion, and adoption) and appropriate referrals.

Study procedures were conducted primarily in the community-based study headquarters located next to a reproductive health clinic that serves an adolescent population. Because of physical safety concerns related to the incidence of gang violence that limited some participants’ mobility, participants could choose to complete study visits at the study office, in a community center, or at their homes.³ The study protocol was approved by the Committee on Human Research at the University of California, San Francisco, and the Institutional Review Board of RTI International.

Measures

Pregnancy Intentions—Pregnancy-intentions questions were asked prospectively at each study visit. Six-month intentions were measured from responses to four items: (1) whether participants wanted to become pregnant or wanted to make a partner pregnant; (2) whether they perceived that any partner wanted them to become pregnant or wanted to make a partner pregnant; (3) how happy they would be if they became pregnant or made a partner pregnant; and (4) the likelihood that they would become pregnant or make a partner pregnant. Response options for pregnancy wantedness and partner’s wantedness were a four-point Likert scale of “definitely no,” “probably no,” “probably yes,” and “definitely yes.” For the happiness item, participants could rank their anticipated feeling as “very

¹The target sample size for this study was 500 total, 250 of each sex. As we approached target enrollment numbers, we set an end date for field-based recruitment based on recruitment rates throughout the study. We experienced higher enrollment than anticipated, yielding a slightly larger sample size.

²Pregnancy tests were conducted using Clearview HCG II, Inverness Medical Professional Diagnostics, Princeton, NJ.

³The procedures for study visits completed at a community center or at home were identical to those completed at study headquarters. For instance, interviews were conducted either with ACASI or by a trained interviewer; pregnancy tests were conducted and results were provided on site.

happy,” “somewhat happy,” “somewhat unhappy,” or “very unhappy.” For the pregnancy-likelihood item, participants indicated a rank on a scale of 0 to 10, with 0 signifying “you will not become/make (someone) pregnant” and 10 meaning “you will definitely become/make (someone) pregnant” in the next six months. For analyses examining the likelihood item alone, the scale was divided into four categories: no likelihood (score = 0), low likelihood (score = 1–4), medium likelihood (score = 5), and high likelihood (score = 6–10). These categories were chosen because participants’ responses clustered on numbers 0, 5, and 10.

In addition to examining single-item intentions measures, we created three joint, dual-item intentions measures by combining pregnancy wantedness with each of the other three intentions items (partner’s wantedness, happiness, and likelihood). Dual-item measures were created by converting each item’s intentions scale into a dichotomous variable reflecting any or some intention (positive or ambivalent) versus no intention. For instance, for the wantedness and partner’s wantedness variables, we categorized participants into either definitely not wanting to become or make a partner pregnant versus wanting a pregnancy to some degree (“definitely yes,” “probably yes,” or “probably no”). We created a nominal categorical variable with the four following outcome categories: “neither want,” “partner only: some wantedness,” “respondent only: some wantedness,” and “both: some wantedness.” Similarly, we split the happiness item into no happiness (“very unhappy”) versus any happiness at all (“very happy,” “somewhat happy,” or “somewhat unhappy”) and combined it with the dichotomous wantedness measure. The final joint measure for wantedness and likelihood was categorized by dividing the likelihood item into no likelihood (score = 0) and any likelihood (score = 1–10). The joint wantedness and likelihood variable, therefore, had four categories: “no wantedness nor likelihood,” “no wantedness, some likelihood,” “some wantedness, no likelihood,” and “some wantedness and likelihood.”⁴

Pregnancy—Pregnancy was defined for girls as either having a positive pregnancy test or as self-reporting a pregnancy at any time in the six months subsequent to when the intention data were collected. For boys, having made someone pregnant was measured by means of self-reporting.

Contraceptive Use—Participants who were currently sexually active, defined as having had vaginal sex in the past six months, reported contraceptive methods they had used. Contraceptive use was categorized as employing a female-controlled hormonal method with or without the use of condoms; using condoms only; and employing no method with any partner. The variable was measured at the visit subsequent to that at which intentions data were collected.

⁴We considered different ways of categorizing individual items for dual-item measures. The reasons for dichotomizing the wantedness, partner’s wantedness, and happiness items as we did was chiefly conceptual. For the wantedness variable, our aim was to compare teenagers who reported any wantedness (either favorable or ambivalent degrees of wantedness) with those who stated that they had no desire for pregnancy at all (that is, any/some versus none). A second consideration was the practical issue that fewer than 5 percent of observations fell in the “probably yes” and “definitely yes” categories, resulting in low power for models predicting incidence of pregnancy. Dichotomizing the happiness variable as “very happy,” “somewhat happy,” or “somewhat unhappy” versus “very unhappy” was also chosen in order to compare clearly teenagers who would feel no happiness about a pregnancy with those who expressed any happiness or ambivalence about the item (any/some versus none). Moreover, we did not think that dividing categories into “very/somewhat unhappy” versus “very/somewhat happy” (yes versus no) would be appropriate because “somewhat happy” and “somewhat unhappy” have similar meanings (“a little bit happy”); dividing these two categories would result in comparison groups containing participants with similar attitudes.

Analyses

We first examined baseline characteristics of girls and boys and used chi-square and t-tests to assess baseline differences between the sexes.

Pregnancy Intentions—We tabulated responses to each of the single-item and dual-item intentions measures for girls and boys separately. To compare responses between girls and boys, we used multinomial logistic regression, controlling for age, Latino ethnicity, language, and partner status. We accounted for the clustering of observations for individuals in the standard error (SE) estimates using a generalized estimating equation (GEE) approach. We used GEE, reporting robust SEs with exchangeable working correlation matrices, for all analyses with clustered observations within individuals.

Pregnancy and Predictive Ability of Intentions—We calculated the six-month simple cumulative incidence of pregnancy separately by sex. Girls who were pregnant at a study visit were not asked about intentions for the next study period and were excluded from analyses until they tested negative for pregnancy.

We examined the proportion of all pregnancies that occurred among teenagers at each level of intention on each single-item and dual-item measure. The independent relationships between each measure and subsequent pregnancy were examined by fitting separate logistic regression (GEE) models for each item and sex. Because we were interested in examining the crude predictive ability of intentions on the incidence of pregnancy regardless of respondents' sociodemographic profiles, no covariables were included in the models predicting pregnancy. For exploratory purposes, we also assessed whether contraceptive use, reported at the subsequent visit, differed by intention among sexually active participants, using multinomial logistic regression (GEE). Because this analysis was restricted to sexually active teenagers and the contraceptive-method variable had multiple categories, we had limited power and thus used the dichotomous forms of intention items.

Stability of Intentions—To examine the extent to which intentions changed over time, we created a variable describing the number of response levels (on each Likert scale) that intentions had changed between six-month visits. We calculated the proportion of visits between which participants had changed their intentions. Finally, we examined the effect of longitudinal changes in intentions on pregnancy risk. In light of the time-ordering available for these longitudinal data, this analysis provides stronger evidence for a causal role of intentions, compared with what would be found by examining intentions measured at the previous visit, and it controls for individuals' history of intentions (Fitzmaurice et al. 2008). We fit logistic regression (GEE) models that include variables for both the longitudinal and cross-sectional effects of each intention item (Fitzmaurice et al. 2008). The longitudinal effect consisted of three dummy variables that captured the effects that changes in intentions had on the odds of pregnancy occurring. For example, in the case of wantedness, the dummy variables were (1) wantedness decreased, (2) wantedness increased, and (3) wantedness did not change (the reference category) over the two visits prior to pregnancy assessment. The cross-sectional effect controlled for the overall intentions level.

The examination of changes in intentions required an assessment of intentions at two points in time preceding a pregnancy; thus, this analysis includes the subset of participants whose pregnancy occurred at or after the third study visit and who completed at least three study visits. Because effect estimates were similar between the sexes, we conducted the stability regression analysis pooled by sex.

We were interested originally in examining whether intentions were more predictive of pregnancy among teenagers whose intentions were stable over time. We were unable,

however, to make a valid assessment of the relationship between stability and pregnancy because the large majority of respondents with stable intentions (that is, those reporting the same level of intention at consecutive visits) fell in the lowest intention category. For example, 95 percent of “stable” observations on the wantedness variable fell in the “definitely do not want” category. A comparison of the predictive ability of intentions among stable versus unstable teenagers would, therefore, have been largely a comparison between favorable and unfavorable intentions.

Analyses included participants who had had at least one follow-up visit. We included the full sample of participants rather than only the sexually active participants for two reasons. First, we hypothesized that pregnancy intentions and sexual activity influence one another; therefore, excluding adolescents who were not sexually active could bias our estimates of intentions and their relationship to pregnancy. Second, we felt that the implications of the findings for the full sample would be more relevant to clinical and research settings because pregnancy intentions and sexual activity change over time among teenagers. Nevertheless, we repeated all analyses using only participants who had ever had sex. Intentions items were administered only to sexually active teenagers at baseline but to all participants at the four subsequent visits. Thus, we repeated calculations omitting observations from the first visit and found that results did not change. Finally, to examine whether results were sensitive to our coding choices, we repeated all analyses using dual-item measures with alternative dichotomies (that is, yes versus no instead of any/some versus none).

Results

Demographic and sexual-history characteristics of the 297 girls and 258 boys who enrolled in the study are shown in Table 1. The mean age of the participants was 16 years (not shown). Three-fourths of the participants identified as being Latino, and 15 percent spoke only Spanish or spoke Spanish better than English. Most (65 percent) of the sample had engaged in vaginal sex at study enrollment, and 18 percent had previously been pregnant or made someone pregnant. Sixty percent of participants had a current sexual partner at study entry. Compared with girls, boys were older, were more likely to speak Spanish, were more likely to have had sex by age 14, and had different types of sexual partnerships.

Girls and boys completed a total of 83 percent (Minnis et al. 2008) and 71 percent of expected follow-up visits, respectively. Overall, 93 percent of girls and 87 percent of boys completed at least one set of two consecutive visits and are included in the analyses. Loss to follow-up, based on number of visits completed and number at which valid intentions data were collected, was unrelated to baseline characteristics with two exceptions. Boys who spoke Spanish only or who spoke Spanish better than English contributed on average one visit fewer than other boys. Among both sexes, those with no current sex partner also contributed fewer observations, largely because the intentions questions were not asked of these participants at baseline.

Pregnancy Intentions

For both sexes, responses varied between the four intentions items (see Table 2). At 86 percent of visits, teens reported “definitely not” wanting a pregnancy in the next six months. At only 43 percent of visits did respondents say that they would be “very unhappy” if pregnancy were to occur. The joint wantedness and happiness item showed substantial discrepancies, reflecting differing intentions among almost half of the participants (43 percent and 46 percent for girls and boys, respectively).

In the aggregate, both sexes ranked their partners’ pregnancy wantedness as higher than their own. Similarly, on the joint wantedness and partner’s wantedness measure, one-fifth of

the responses indicated inconsistency between the respondent's and their partner's intentions for pregnancy, and the large majority of this perceived inconsistency was attributed to the partner's greater wantedness. Eighty-two percent of girls' responses reflected agreement in pregnancy wantedness (neither or both wanting); 14 percent conveyed that the male partner had some desire for a pregnancy when the respondent had none; and only 4 percent depicted the respondent but not her partners as having some desire for a pregnancy. Boys were also more likely to attribute greater desire for a pregnancy to their partners; only 4 percent of their responses conveyed that they had some desire for a pregnancy while their partner did not, whereas 18 percent depicted only their female partner as having some desire for one.

On one hand, at only 14 percent of visits did participants report any degree of wantedness of pregnancy in the next six months. On the other hand, at 31 percent of girls' visits and 49 percent of boys' visits, respondents reported some likelihood that they would become or make a partner pregnant. Boys reported a higher likelihood of pregnancy than girls ($p < 0.001$). Responses to the joint pregnancy wantedness and likelihood item also pointed to significant discrepancies: 23 percent of girls' responses indicated "no wantedness, some likelihood," compared with 40 percent of boys' responses, largely because boys reported higher assessments of likelihood.

Pregnancy and Predictive Ability of Intentions—A total of 72 pregnancies occurred among 56 girls during the two-year study interval (the six-month cumulative incidence equals 8 percent). Thirty pregnancies (42 percent) were detected by means of self-report only, 15 by testing only (21 percent), and 27 by both self-report and testing (38 percent). Boys reported being responsible for 50 pregnancies (the six-month cumulative incidence equals 10 percent). Seven boys reported two pregnancies and three boys reported three pregnancies over the two-year study.

The probability of pregnancy increased incrementally by intentions level, as shown in Table 3. For instance, girls who responded "probably yes" or "definitely yes" to the wantedness item had far higher odds of subsequent pregnancy (OR = 9.7) than did those who reported "definitely no." Nevertheless, most pregnancies (73 percent) occurred among girls who said that they definitely did not want to become pregnant. Partner's intentions predicted pregnancy at each level of intention; girls who perceived that their partner definitely wanted a pregnancy had higher odds of becoming pregnant (OR = 4.7) than those who perceived their partner as definitely not wanting a pregnancy. Reporting the highest level of likelihood of becoming pregnant was also strongly predictive of pregnancy (OR = 6.7), but reporting low or medium likelihood of becoming pregnant did not increase risk substantially for girls.

Dual-item measures were also predictive of pregnancy among girls to some degree. Girls who reported that they and their partner both had some desire for a pregnancy had a fourfold increase (OR = 4.1) in odds of having a pregnancy as did those couples for whom neither wanted a pregnancy. No girls who wanted to become pregnant but whose partner did not want a pregnancy actually became pregnant, although few girls fell into this category. Pregnancy risk more than doubled (OR = 2.5), however, if a girl perceived that her partner wanted her to become pregnant even though she did not want to have a child. Girls reporting "some wantedness and happiness" were at increased risk of pregnancy (OR = 2.4) compared with the reference group. Finally, although the response "no wantedness, some likelihood" did not predict pregnancy, those who expressed "some wantedness and likelihood" had three times the odds of experiencing pregnancy (OR = 3.2).

On the wantedness item, boys who wanted a pregnancy were not substantially more likely to make a partner pregnant. Boys in the highest categories of partner's wantedness (OR = 6.0), happiness (OR = 6.8), and likelihood (OR = 6.3) were more likely, however, to make a

partner pregnant than were those in the lowest categories. As with girls, boys who both wanted a pregnancy and perceived their partners to want one were more likely to make their partners pregnant (OR = 3.3) than were those who responded that neither wanted a pregnancy.

Almost all sexually active teens reported using a contraceptive method, either a hormonal method (with or without condoms) (56 percent) or condoms only (36 percent) as shown in Table 4. Although regression analyses (not shown) indicated that lower intentions to become pregnant were associated with using any method, differences in hormonal method use and in condom use by intentions level were minor. For instance, among girls who gave “definitely no” responses to the wantedness item, six months later, 55 percent used a hormonal method and 37 percent used condoms; these proportions were 57 percent and 26 percent among those reporting any wantedness ($p = 0.14$; not shown). Nevertheless, two times more girls who expressed any desire to become pregnant subsequently used no method, compared with their counterparts who definitely did not want to become pregnant (17 percent versus 8 percent). The likelihood item was the only item not associated with subsequent contraceptive method use among girls. Among boys, intentions items were not associated with reported contraceptive use.

Stability of Intentions—Longitudinal analyses revealed that responses to each intentions item varied between visits. The wantedness item showed the least change over time; 82 percent of adjacent responses reflected the same intention (see Table 5). Nevertheless, 10 percent of responses showed an increase in wantedness over six months, and 8 percent showed a decrease. Happiness showed more variation over time: only 60 percent of responses remained the same between adjacent study visits; 24 percent of responses became more favorable and 16 percent became less favorable over six months. About two-thirds of changes in intention across items were between adjacent levels; one-third reflected changes of more than one level (not shown). Dynamics were similar between girls and boys over time.

Our logistic regression models show that increases over six months in three of the four intentions items were associated with increased risk of pregnancy, controlling for overall intentions level. For example, teenagers whose desire for a pregnancy increased between two visits were nearly three times more likely than those at the same intentions level whose intentions remained stable to experience a pregnancy (OR = 2.8). Although decreased wantedness was associated with decreased likelihood of pregnancy, this effect did not reach statistical significance. Similar effects were seen for changes in partner’s wantedness and perceived likelihood of pregnancy; no effects were seen for changes in happiness.

Subgroup Results

Results were virtually identical when analyses were restricted to sexually experienced participants. Results were generally similar by interview mode (ACASI or interviewer administered) with two exceptions. Girls completing interviews by means of ACASI ranked pregnancy likelihood as higher than did those completing interviewer-administered surveys. Among boys, rankings of pregnancy wantedness and partner’s wantedness were more favorable when they were interviewed by means of ACASI, compared with rankings they gave in interviewer-administered surveys.

Finally, we repeated all analyses using dichotomous versions of intention measures. Although some changes were found, as expected, the overall conclusions remain similar.

Discussion and Conclusion

This study of predominantly Latino teenagers is the first to examine how well different measures of pregnancy intentions predict subsequent pregnancy among male and female adolescents. Although the probability of experiencing a pregnancy generally increased with greater reported desire for one, the odds of pregnancy were, by and large, elevated only for the highest response categories for each item, categories into which only small proportions of participants fell. In fact, the largest proportion of pregnancies occurred among boys and girls who reported no pregnancy intentions or the lowest levels of intentions. Therefore, although adolescents who expressed positive intentions certainly were at increased risk of pregnancy, those who expressed lower intentions were, nevertheless, still at risk. These data suggest that simple intentions measures, such as those used in this study, may be of little use in predicting pregnancy among teenagers, except at the highest levels of intention.

Many explanations exist for the patterns of pregnancy prediction we observed. Consistent with the intentionality-based behavioral models that have been the dominant approach to understanding women's reproductive patterns, some have suggested that adolescents are as capable as adults of making rational decisions and formulating behavioral intentions, even in the realm of sexual behavior (O'Donoghue and Rabin 2000). Teenagers may, however, give short-term benefits, such as identity formation and peer reactions, more weight than long-term consequences, and they are less accurate in anticipating how they will feel about current decisions in the future. If these points are true, adolescents may hold rational behavioral intentions to avoid pregnancy and modify those intentions when they consider competing desires and consequences in the moment of sexual decision making, such as feeling attached to a partner or facing the real prospect of discussing contraceptive use (Luker 1975). A proportion of the pregnancies deemed unintended in this study may, therefore, have been intended, at least to some degree, at the time of conception.

In this study, adolescents' reported intentions with regard to pregnancy fluctuated for a substantial portion of participants between visits made six months apart. Their intentions may have changed more frequently than we were able to capture, depending on partnerships, life experiences, or interactions with peers and family. Research on which partnership, peer, and lifestyle changes in teenagers' lives lead to changes in intentions may be helpful in elucidating the underlying causes of teen pregnancy.

Among the participants in this study, intentions to avoid pregnancy may not have translated into safe sex behaviors because other factors, such as lack of knowledge of contraceptive options, impaired judgment due to use of alcohol, and gender-based power imbalances that constrain girls' power to negotiate condom use or abstinence, inhibited their abilities to prevent unintended pregnancy (Pulerwitz et al. 2000; Santelli et al. 2003). Such a scenario accords with the concept of intervening variables in the theory of planned behavior, whereby intentions represent an "intention to try" to avoid pregnancy, and pregnancies that occur are the consequence of intervening variables such as inability to request or demand safe sex behavior (Ajzen 1985). Although the large majority of sexually active adolescents in this study reported use of a contraceptive regardless of their stated intentions, the high incidence of pregnancy in this group suggests that contraceptive use for many was sporadic or inconsistent. Such discrepancies between stated intentions and contraceptive use have been found in other studies of adolescents (Rosengard et al. 2004) and adults (Trussell et al. 1999; Sable et al. 2000; Petersen et al. 2001; Frost et al. 2007).

Teenagers who do not want to have a child also may fail to recognize the real risk associated with their behaviors (O'Donoghue and Rabin 2000). Indeed, half of the girls who became pregnant during the course of this study had indicated previously that they felt there was no

likelihood that they would become pregnant. Some studies of adolescent girls have found that girls' beliefs or fears about infertility are relatively common (Stevens-Simon et al. 1996; White et al. 2006). Girls who believe that they are infertile or who do not understand that they are vulnerable to pregnancy may not use a contraceptive method because they do not believe that unprotected sex presents a risk for pregnancy.

Additional explanations for the poor predictive ability of intentions items except at the highest levels are that teenagers may hold intentions that are more nuanced than our questionnaire items were able to capture, or that many do not, in fact, hold clear and rational pregnancy intentions. Even participants who did not want to become pregnant indicated that they would be happy if they became pregnant or that they thought pregnancy was at least somewhat likely. These data support previous studies suggesting that the feelings many teenagers hold about the prospect of pregnancy are complex and may be ambivalent or even contradictory (Zabin et al. 1993; Rosengard et al. 2004 and 2005). The data also lend credence to recent critiques of the rational intentions paradigm, arguing that the predominant focus on intentional action ignores the degree to which human action is determined by culturally informed habits, customs, or systems of meaning of which individuals are not explicitly aware (Esacove 2008; Johnson-Hanks 2008).

Regardless of which explanations account for the study's results, the simple, categorical pregnancy-intentions questions we used probably did not capture respondents' intentions very accurately. Research is needed into the development and psychometric testing of a multi-item measure that assesses reproductive intentions prior to the occurrence of pregnancy. Such a measure would come closer than individual items to capturing the underlying construct of intentionality and would allow participants' reproductive attitudes and intentions to be placed along a continuous spectrum of intentionality. In a recent analysis of the 2002 NSFG intentions questions, Santelli and colleagues (2009) argue that a new multiple-category measure of intentions represents an improvement over the traditional three-category approach and should be employed by researchers using the retrospective NSFG questions. Although continuous scales of pregnancy intentions have been developed and tested, these scales either assess intentions retrospectively (Barrett et al. 2004) or were developed primarily for adult populations and focus mainly on measuring the active planning of pregnancy (Morin et al. 2003), which may be distinct from the desire for pregnancy (Trussell et al. 1999). Experts in adolescents' pregnancy intentions have posited that many teenagers become pregnant because they lack a firm commitment to avoid doing so, not because they actively want or plan to have a child (Stevens-Simon et al. 2001). A measure of intention may more accurately predict the occurrence of pregnancy if it captures both the strength of intention to become pregnant and the strength of the intention to avoid doing so.

The results of our study reaffirm the importance of male partners' intentions in adolescent pregnancy. Prior studies of teenagers of mixed races (Bruckner et al. 2004) and of Latinas (Frost and Oslak 1999; Cowley and Farley 2001) have documented the importance of partners' intentions in determining an adolescent girl's intentions. Our results go a step further by showing that a relationship exists between perceived partners' intentions, measured prior to pregnancy occurrence, and subsequent pregnancy. The role of partners' intentions in determining risk, particularly among Latinas, has been attributed to power imbalances between the sexes or to the importance of a girl's belief that her partner wants to have a child, an indication that he intends to support her once a child is born (Unger and Molina 1998; Pulerwitz et al. 2000; Zabin et al. 2000; Driscoll et al. 2001; Gilliam 2007). However, it is possible that female teenagers feel more comfortable attributing their own desire for pregnancy to their partners if they perceive researchers or health practitioners as holding judgmental attitudes toward pregnancy among teenagers. Another explanation for

the relationship that we observed between partner's intentions and pregnancy may be that adolescents who do not use contraceptives regularly attribute their nonuse to their partners' desire to have a child. In any case, these results suggest that in assessing pregnancy risk, asking girls about their partners' intentions may be as important or even more important than asking them about their own intentions.

In this study, boys generally voiced intentions similar to those of girls with regard to wanting a pregnancy and the degree of happiness they would feel about making a girl pregnant. Boys, however, expressed higher levels of likelihood that a pregnancy would occur in the next six months. Teenaged boys may be more willing than girls to acknowledge engaging in risky behavior or to realistically assess the risk of pregnancy, even if they do not want a pregnancy. Prior research that has examined the perceived likelihood of pregnancy as an intentions measure has suggested that adolescents who state that pregnancy is likely to occur may hold ambivalent and conflicting attitudes toward this likelihood (Rosengard et al. 2004 and 2005). Our finding that boys expressed higher levels of likelihood of pregnancy than girls, given similar levels of wantedness, may indicate that boys feel greater ambivalence toward pregnancy, or that they hold pregnancy attitudes with less conviction, particularly because they face fewer repercussions if pregnancy occurs. Indeed, research has shown that adolescent males hold varied and sometimes conflicting attitudes toward impregnating a girl (Rosengard et al. 2005). Some boys may understand the importance of taking responsibility for preventing pregnancy and prioritizing their future education and careers, or for taking care of a child they father (Gohel et al. 1997; Sonenstein et al. 1997; Marcell et al. 2003). At the same time, they may also place importance on being what they perceive as strong or manly, which may contribute to their engaging in risky sexual behavior or cause them to be reticent about seeking reproductive health information and care (Goodyear et al. 2000; Marcell et al. 2003). Further qualitative research into the attitudes of adolescents who do not want a pregnancy yet acknowledge its likelihood may shed light on some determinants of pregnancy among them.

Several limitations of this study should be considered. Although our findings concerning the incidence of pregnancy were drawn from self-reports as well as urine pregnancy tests, which constitutes an advantage over some prior analyses (Jaccard et al. 2003; Bruckner et al. 2004), we had to rely on self-reports alone for boys. Moreover, boys must depend on their female partners to detect and report to them that they have become pregnant. Boys are, therefore, more likely than girls to have under-reported the incidence of pregnancy, which precludes us from comparing the predictive ability of intentions items between the sexes.

Another limitation of our study is that because the boys in this study were not necessarily the sex partners of the girls, we could not examine directly the effects of intentions of both partnership members on the occurrence of pregnancy. Our recruitment strategy was designed, however, to capture a peer and sex-partner network of teenagers. Thus, the boys and girls in this study came from similar social, neighborhood, and peer groups, strengthening the comparability of boys and girls on intentions items. As a consequence of our sampling approach and the unique target population, our results may not be generalizable to other predominantly Latino communities in the United States or to adolescents of other ethnicities. Finally, sample-size constraints limited the precision of some of our estimates and our ability to assess interactions between intentions and other variables, including contraceptive use.

Consideration of how teenagers feel about the prospect of pregnancy is important for understanding their sexual-risk-taking behaviors and for creating and evaluating interventions with the goal of preventing pregnancy among adolescents. Persistently high pregnancy rates among Latino adolescents in the United States make imperative a focus on

risk factors for pregnancy in this group, including their pregnancy intentions (Ventura et al. 2008). Although Latino teenagers overall may express more favorable attitudes toward pregnancy compared with teenagers of other ethnicities, most pregnancies in this study occurred to those who had expressed no intention or likelihood of pregnancy, which suggests that these teenagers, as is the case for many others, had difficulty controlling their fertility. This study also suggests that determining how teens really feel about pregnancy may not be a straightforward task, as many may hold ambivalent attitudes that can change over time. The development of appropriate strategies to reduce pregnancy among adolescents would benefit from a more sophisticated and nuanced understanding of the subtle influences that determine how a young person views the prospect of pregnancy and what determines whether teenagers actively protect themselves from the risk of unintended pregnancies. Creation of a more refined measure of pregnancy intentions, perhaps developed through qualitative research, and its subsequent incorporation into survey questionnaires would help to advance this field of inquiry.

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References

- Abma, Joyce C.; Martinez, Gladys M.; Mosher, William D.; Dawson, Brittany S. Vital and Health Statistics, series 23, no. 24. Atlanta, GA: National Center for Health Statistics; 2004. Teenagers in the United States: Sexual activity, contraceptive use, and childbearing, 2002.
- Adler, L.; Rogers, J. Documentary film based on a report by P. Braveman, C. Brindis, M.A. Biggs, K. Marchi, A.M. Minnis, and L. Ralph. Berkeley, CA: Ideas in Motion; 2008. A Question of Hope: Reducing Latina Teen Childbearing in California. (producers and directors) <<http://bixbycenter.ucsf.edu/videos/video-lo-1.html>>
- Ajzen, Icek. From intentions to actions: A theory of planned behavior. In: Kuhl, Julius; Beckmann, Jürgen, editors. Action Control: From Cognition to Behavior. New York: Springer-Verlag; 1985. p. 11-39.
- Auerswald, Colette L.; Greene, Karen; Minnis, Alexandra M.; Doherty, Irene; Ellen, Jonathan; Padian, Nancy S. Qualitative assessment of venues for purposive sampling of hard-to-reach youth: An illustration in a Latino community. Sexually Transmitted Diseases. 2004; 31(2):133–138. [PubMed: 14743078]
- Bachrach, Christine A.; Newcomer, Susan. Intended pregnancies and unintended pregnancies: Distinct categories or opposite ends of a continuum? Family Planning Perspectives. 1999; 31(5):251–252. [PubMed: 10723654]
- Bankole, Akinrinola; Westoff, Charles F. The consistency and validity of reproductive attitudes: Evidence from Morocco. Journal of Biosocial Science. 1998; 30(4):439–455. [PubMed: 9818553]
- Barrett, Geraldine; Wellings, Kaye. What is a 'planned' pregnancy? Empirical data from a British study. Social Science & Medicine. 2002; 55(4):545–557. [PubMed: 12188462]
- Barrett, Geraldine; Smith, Sarah C.; Wellings, Kaye. Conceptualisation, development, and evaluation of a measure of unplanned pregnancy. Journal of Epidemiology and Community Health. 2004; 58(5):426–433. [PubMed: 15082745]

- Bruckner, Hannah; Martin, Anne; Bearman, Peter S. Ambivalence and pregnancy: Adolescents' attitudes, contraceptive use and pregnancy. *Perspectives on Sexual and Reproductive Health*. 2004; 36(6):248–257. [PubMed: 15687083]
- Cowley, Carol; Farley, Tillman. Adolescent girls' attitudes toward pregnancy: The importance of asking what the boyfriend wants. *The Journal of Family Practice*. 2001; 50(7):603–607. [PubMed: 11485709]
- Doherty, Irene A.; Minnis, Alexandra M.; Auerswald, Colette L.; Adimora, Adaora A.; Padian, Nancy S. Concurrent partnerships among adolescents in a Latino community: The Mission District of San Francisco, California. *Sexually Transmitted Diseases*. 2007; 34(7):437–443. [PubMed: 17195772]
- Driscoll, Anne K.; Antonia Biggs, M.; Brindis, Claire D.; Yankah, Ekua. Adolescent Latino reproductive health: A review of the literature. *Hispanic Journal of Behavioral Sciences*. 2001; 23(3):255–326.
- Dudgeon, Matthew R.; Inhorn, Marcia C. Men's influences on women's reproductive health: Medical anthropological perspectives. *Social Science & Medicine*. 2004; 59(7):1,379–1,395. [PubMed: 15087138]
- Esacove, Anne. Making sense of sex: Rethinking intentionality. *Culture Health & Sexuality*. 2008; 10(4):377–390.
- Finer, Lawrence B.; Henshaw, Stanley K. Disparities in rates of unintended pregnancy in the United States, 1994 to 2001. *Perspectives on Sexual and Reproductive Health*. 2006; 38(2):90–96. [PubMed: 16772190]
- Fitzmaurice, Garrett; Davidian, Marie; Verbeke, Geert; Molenberghs, Geert. *Longitudinal Data Analysis: A Handbook of Modern Statistical Methods*. London: Chapman & Hall/CRC Press; 2008.
- Frost, Jennifer J.; Driscoll, Anne K. Occasional Report. Vol. 19. New York: Alan Guttmacher Institute; 2006. Sexual and reproductive health of U.S. Latinas: A literature review.
- Frost, Jennifer J.; Oslak, Selene. Occasional Report No. 2. New York: Alan Guttmacher Institute; 1999. Teenagers' pregnancy intentions and decisions: A study of young women in California choosing to give birth.
- 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]
- Gilliam, Melissa L. The role of parents and partners in the pregnancy behaviors of young Latinas. *Hispanic Journal of Behavioral Sciences*. 2007; 29(1):50–67.
- Gipson, Jessica D.; Koenig, Michael A.; Hindin, Michelle J. The effects of unintended pregnancy on infant, child, and parental health: A review of the literature. *Studies in Family Planning*. 2008; 39(1):18–38. [PubMed: 18540521]
- Gohel, Mira; Diamond, James J.; Chambers, Christopher V. Attitudes toward sexual responsibility and parenting: An exploratory study of young urban males. *Family Planning Perspectives*. 1997; 29(6):280–283. [PubMed: 9429875]
- Goodyear, Rodney K.; Newcomb, Michael D.; Allison, Russell D. Predictors of Latino men's paternity in teen pregnancy: Test of a mediational model of childhood experiences, gender role attitudes, and behaviors. *Journal of Counseling Psychology*. 2000; 47(1):116–128.
- Heavey, Elizabeth J.; Moysich, Kirsten B.; Hyland, Andrew; Druschel, Charlotte M.; Sill, Michael W. Differences in pregnancy desire among pregnant female adolescents at a state-funded family planning clinic. *Journal of Midwifery and Women's Health*. 2008; 53(2):130–137.
- Jaccard, James; Dodge, Tonya; Dittus, Patricia. Do adolescents want to avoid pregnancy? Attitudes toward pregnancy as predictors of pregnancy. *Journal of Adolescent Health*. 2003; 33(2):79–83. [PubMed: 12890598]
- Johnson-Hanks, Jennifer. Demographic transitions and modernity. *Annual Review of Anthropology*. 2008; 37:301–315.
- Joyce, Ted; Kaestner, Robert; Korenman, Sanders. The stability of pregnancy intentions and pregnancy-related maternal behaviors. *Maternal and Child Health Journal*. 2000; 4(3):171–178. [PubMed: 11097504]

- Kaufmann, Rachel B.; Morris, Leo; Spitz, Alison M. Comparison of two question sequences for assessing pregnancy intentions. *American Journal of Epidemiology*. 1997; 145(9):810–816. [PubMed: 9143211]
- Kendall, Carl; Afbale-Munsuz, Aimee; Speizer, Ilene; Avery, Alexis; Schmidt, Norene; Santelli, John. Understanding pregnancy in a population of innercity women in New Orleans: Results of qualitative research. *Social Science & Medicine*. 2005; 60(2):297–311. [PubMed: 15522486]
- Klerman, Lorraine V. The intendedness of pregnancy: A concept in transition. *Maternal and Child Health Journal*. 2000; 4(3):155–162. [PubMed: 11097502]
- Kost, Kathryn; Henshaw, Stanley K.; Carlin, Liz. *US teenage pregnancies, births and abortions: National and state trends and trends by race and ethnicity*. New York: Guttmacher Institute; 2010.
- Lindberg, Laura D.; Finer, Lawrence B.; Stokes-Prindle, Cecily. How not to measure pregnancy intentions: Teens and attitude stability. *Journal of Adolescent Health*. 2008; 42(2):S39–S40.
- Luker, Kristin C. *Taking Chances: Abortion and the Decision Not to Contracept*. Berkeley, CA: University of California Press; 1975.
- Luker, Kristin C. A reminder that human behavior frequently refuses to conform to models created by researchers. *Family Planning Perspectives*. 1999; 31(5):248–249. [PubMed: 10723651]
- Marcell, Arik V.; Raine, Tina; Eyre, Stephen L. Where does reproductive health fit into the lives of adolescent males? *Perspectives on Sexual and Reproductive Health*. 2003; 35(4):180–186. [PubMed: 12941651]
- Miller, Warren B.; Pasta, David J. Behavioral intentions: Which ones predict fertility behavior in married couples? *Journal of Applied Social Psychology*. 1995; 25(6):530–555.
- Minnis, Alexandra M.; Auerswald, Colette L.; Doherty, Irene; Ellen, Jonathan; Shiboski, Stephen C.; Padian, Nancy S. *The Network Paradigm in Research on Drug Abuse, HIV, and Other Blood-Borne and Sexually Transmitted Infections: New Perspectives, Approaches, and Applications*. Bethesda, MD: National Institute on Drug Abuse, National Institutes of Health; 2002. Qualitative and quantitative methods for developing a venue-based sampling approach for a study of Latino adolescents' social and sexual networks; p. 34-40.
- Minnis, Alexandra M.; Moore, JG.; Doherty, IA., et al. Gang exposure and pregnancy incidence among female adolescents in San Francisco: Evidence for the need to integrate reproductive health with violence prevention efforts. *American Journal of Epidemiology*. 2008; 167(9):1,102–1,109. [PubMed: 18006901]
- Morin, Pascale; Payette, Hélène; Moos, Merry-K.; St-Cyr-Tribble, Denise; Niyonsenga, Théophile; De Wals, Philippe. Measuring the intensity of pregnancy planning effort. *Paediatric and Perinatal Epidemiology*. 2003; 17(1):97–105. [PubMed: 12562477]
- O'Donoghue, Ted; Rabin, Matthew. eScholarship Repository. University of California; Berkeley, CA: 2000. Risky behavior among youths: Some issues from behavioral economics. <<http://escholarship.org/uc/item/5sf0z5rs>>
- Oropesa RS. Normative beliefs about marriage and cohabitation: A comparison of non-Latino Whites, Mexican Americans, and Puerto Ricans. *Journal of Marriage and the Family*. 1996; 58(1):49–62.
- Petersen, Ruth; Gazmararian, Julie A.; Clark, Kathryn A.; Green, Diane C. How contraceptive use patterns differ by pregnancy intention: Implications for counseling. *Women's Health Issues*. 2001; 11(5):427–435.
- Poole, Victoria L.; Flowers, Juanzetta S.; Goldenberg, Robert L.; Cliver, Suzanne P.; McNeal, Sandre. Changes in intendedness during pregnancy in a high-risk multiparous population. *Maternal and Child Health Journal*. 2000; 4(3):179–182. [PubMed: 11097505]
- Pulerwitz, Julie; Gortmaker, Stephen L.; DeJong, William. Measuring sexual relationship power in HIV/STD research. *Sex Roles*. 2000; 42(7–8):637–660.
- Quesnel-Vallée, Amélie; Philip Morgan, S. Missing the target? Correspondence of fertility intentions and behavior in the U.S. *Population Research and Policy Review*. 2004; 22(5–6):497–525.
- Rosengard, Cynthia; Phipps, Maureen G.; Adler, Nancy E.; Ellen, Jonathan M. Adolescent pregnancy intentions and pregnancy outcomes: A longitudinal examination. *Journal of Adolescent Health*. 2004; 35(6):453–461. [PubMed: 15581524]

- Rosengard, Cynthia; Phipps, Maureen G.; Adler, Nancy E.; Ellen, Jonathan M. Psychosocial correlates of adolescent males' pregnancy intention. *Pediatrics*. 2005; 116(3):e414–e419. [PubMed: 16140687]
- Roy, Tarun K.; Sinha, RK.; Koenig, Michael; Mohanty, Sanjay K.; Patel, Sangram K. Consistency and predictive ability of fertility preference indicators: Longitudinal evidence from rural India. *International Family Planning Perspectives*. 2008; 34(3):138–145. [PubMed: 18957356]
- Sable, Marjorie R.; Kay Libbus, M.; Chiu, Jing-Er E. Factors affecting contraceptive use in women seeking pregnancy tests: Missouri, 1997. *Family Planning Perspectives*. 2000; 32(3):124–131. [PubMed: 10894258]
- Santelli, John S.; Lindberg, Laura Duberstein; Orr, Mark G.; Finer, Lawrence B.; Speizer, Ilene. Toward a multidimensional measure of pregnancy intentions: Evidence from the United States. *Studies in Family Planning*. 2009; 40(2):87–100. [PubMed: 19662801]
- Santelli, John; Rochat, Roger; Hatfield-Timajchy, Kendra, et al. The measurement and meaning of unintended pregnancy. *Perspectives on Sexual and Reproductive Health*. 2003; 35(2):94–101. [PubMed: 12729139]
- Schoen, Robert; Astone, Nan Marie; Kim, Young J.; Nathanson, Constance A.; Fields, Jason M. Do fertility intentions affect fertility behavior? *Journal of Marriage and the Family*. 1999; 61(3):790–799.
- Sonenstein, Freya L.; Stewart, Kellie; Lindberg, Laura Duberstein; Williams, Sean. *Involving males in preventing teen pregnancy: A guide for program planners*. Washington, DC: Urban Institute; 1997.
- Stevens-Simon, Catherine; Beach, Roberta K.; Klerman, Lorraine V. To be rather than not to be: That is the problem with the questions we ask adolescents about their childbearing intentions. *Archives of Pediatrics and Adolescent Medicine*. 2001; 155(12):1,298–1,300.
- Stevens-Simon, Catherine; Kelly, Lisa; Singer, Dena; Cox, Amy. Why pregnant adolescents say they did not use contraceptives prior to conception. *Journal of Adolescent Health*. 1996; 19(1):48–53. [PubMed: 8842860]
- Trussell, James; Vaughan, Barbara; Stanford, Joseph. Are all contraceptive failures unintended pregnancies? Evidence from the 1995 National Survey of Family Growth. *Family Planning Perspectives*. 1999; 31(5):246–247. 260. [PubMed: 10723650]
- Unger, Jennifer B.; Molina, Gregory B. Contraceptive use among Latina women: Social, cultural, and demographic correlates. *Women's Health Issues*. 1998; 8(6):359–369.
- United States Agency for International Development (USAID) and Macro International. *Demographic and Health Surveys, Women's Questionnaire*. Calverton, MD: Macro International; 2008.
- Ventura, Stephanie J.; Abma, Joyce C.; Mosher, William D.; Henshaw, Stanley K. *National Vital Statistics Reports*. Vol. 56. Atlanta, GA: National Center for Health Statistics; 2008. Estimated pregnancy rates by outcome for the United States, 1990–2004.
- Westoff, Charles F.; Ryder, Norman B. The predictive validity of reproductive intentions. *Demography*. 1977; 14(4):431–453. [PubMed: 913730]
- White, Emily; Rosengard, Cynthia; Weitzen, Sherry; Meers, Ann; Phipps, Maureen G. Fear of inability to conceive in pregnant adolescents. *Obstetrics and Gynecology*. 2006; 108(6):1,411–1,416.
- Williams, Lindy; Abma, Joyce C.; Piccinino, Linda J. The correspondence between intention to avoid childbearing and subsequent fertility: A prospective analysis. *Family Planning Perspectives*. 1999; 31(5):220–227. [PubMed: 10723646]
- Zabin, Laurie Schwab; Astone, Nan Marie; Emerson, Mark R. Do adolescents want babies? The relationship between attitudes and behavior. *Journal of Research on Adolescence*. 1993; 3(1):67–86. [PubMed: 12318551]
- Zabin, Laurie Schwab; Huggins, George R.; Emerson, Mark R.; Cullins, Vanessa E. Partner effects on a woman's intention to conceive: 'Not with this partner.' *Family Planning Perspectives*. 2000; 32(1):39–45. [PubMed: 10710705]

Table 1

Percentage of study participants, by selected demographic characteristics and sexual history, according to sex, Mission Teen Health Project, San Francisco, California, 2001–04

Characteristic	Girls (n = 297)		Boys (n = 258)		Total (N = 555)	
	Percent	(n)	Percent	(n)	Percent	(n)
Demographic						
Age (years) (n = 551)						*
14–15	36.5	(108)	27.8	(71)	32.5	(179)
16–17	41.2	(122)	33.3	(85)	37.6	(207)
18–19 ^a	22.3	(66)	38.8	(99)	30.0	(165)
Ethnicity (n = 552)						
Latino	77.7	(230)	70.4	(181)	74.5	(411)
Other	22.3	(66)	29.3	(75)	25.5	(141)
Language (n = 535)						*
English/English better	65.5	(190)	61.2	(150)	63.6	(340)
English and Spanish equally	23.8	(69)	19.2	(47)	21.7	(116)
Spanish/Spanish better	10.7	(31)	19.6	(48)	14.8	(79)
Sexual history						
Ever had sex (n = 552)	62.5	(185)	68.4	(175)	65.2	(360)
Had sex by age 14 (n = 547)	24.9	(73)	37.8	(96)	30.9	(169)
Ever pregnant (n = 547)	17.7	(52)	17.8	(45)	17.7	(97)
Current partner status (n = 530)						*
No sexual partner	41.5	(119)	37.9	(92)	39.8	(211)
Main partner only	36.6	(105)	23.9	(58)	30.8	(163)
Main partner and others	14.6	(42)	22.2	(54)	18.1	(96)
Casual partners only	7.3	(21)	16.1	(39)	11.3	(60)
Current use of contraceptive (n = 312) ^b						
Hormonal or dual	23.9	(39)	20.8	(31)	22.4	(70)
Condom only	63.8	(104)	71.8	(107)	67.2	(211)
None	12.3	(20)	7.4	(11)	9.9	(31)

* Differences between girls and boys significant at $p \leq 0.05$.

^a Three boys aged 19 at eligibility screening turned 20 by their baseline visit.

^b Includes only teenagers who were sexually active.

Table 2

Percentage of responses among adolescents surveyed across multiple visits, by pregnancy-intentions measure, according to sex, Mission Teen Health Project, San Francisco, California, 2001–04

Pregnancy-intentions measure	Responses across 1,285 visits among 297 girls		Responses across 1,003 visits among 258 boys		Total responses (N = 2,288)	
	Percent	(n)	Percent	(n)	Percent	(n)
Single-item measure						
Wantedness						
Definitely no	85.8	(953)	86.7	(778)	86.2	(1,731)
Probably no	10.3	(114)	9.6	(86)	10.0	(200)
Probably yes	3.4	(38)	2.6	(23)	3.0	(61)
Definitely yes	0.5	(6)	1.1	(10)	0.8	(16)
Partner's wantedness						
Definitely no	75.0	(827)	73.0	(645)	74.1	(1,472)
Probably no	12.6	(139)	17.0	(150)	14.5	(289)
Probably yes	7.8	(86)	6.9	(61)	7.4	(147)
Definitely yes	4.6	(51)	3.2	(28)	4.0	(79)
Happiness						
Very unhappy	43.4	(465)	42.3	(375)	42.9	(840)
Somewhat unhappy	23.3	(250)	22.6	(200)	23.0	(450)
Somewhat happy	25.5	(273)	28.1	(249)	26.7	(522)
Very happy	7.8	(83)	7.1	(63)	7.5	(146)
Likelihood of pregnancy						
No likelihood	69.5	(775)	50.8	(455)	61.2	(1,230)
Low likelihood	20.2	(225)	31.6	(283)	25.3	(508)
Medium likelihood	7.4	(83)	11.4	(102)	9.2	(185)
High likelihood	2.9	(32)	6.2	(55)	4.3	(87)
Dual-item measure						
Wantedness and partner's wantedness						
Neither want	71.6	(788)	68.9	(607)	70.4	(1,395)
Partner only: some wantedness	14.2	(156)	17.7	(156)	15.7	(312)
Respondent only: some wantedness	3.5	(38)	4.2	(37)	3.8	(75)
Both: some wantedness	10.8	(119)	9.2	(81)	10.1	(200)

Pregnancy-intentions measure	Responses across 1,285 visits among 297 girls		Responses across 1,003 visits among 258 boys		Total responses (N = 2,288)		
	Percent	(n)	Percent	(n)	p-value ^a	Percent	(n)
Wantedness and happiness							
No wantedness nor happiness	43.4	(460)	41.5	(366)		42.3	(826)
No wantedness, some happiness	42.5	(455)	45.2	(399)		43.7	(854)
Some wantedness, no happiness	0.5	(5)	1.0	(9)		0.7	(14)
Some wantedness and happiness	14.0	(150)	12.3	(109)		13.3	(259)
Wantedness and likelihood					***		
No wantedness nor likelihood	63.2	(702)	47.3	(421)		56.1	(1,123)
No wantedness, some likelihood	22.6	(251)	39.5	(352)		30.1	(603)
Some wantedness, no likelihood	6.2	(69)	3.6	(32)		5.0	(101)
Some wantedness and likelihood	8.0	(89)	9.7	(86)		8.7	(175)

*** Difference significant at $p \leq 0.001$.

^aP-values compare girls with boys and are based on relative-risk ratios calculated using multinomial logistic regression, adjusting for age, Latino ethnicity, language, and current partner status, accounting for the clustering of observations within individuals.

Table 3

Percentage of pregnancies and odds ratios predicting incidence of pregnancy, by pregnancy-intentions measure, according to sex, Mission Teen Health Project, San Francisco, California, 2001–04

Pregnancy-intentions measure	Pregnancies (n = 72) among 263 girls		Pregnancies (n = 50) among partners of 181 boys	
	% of pregnancies	Odds ratio	% of pregnancies	Odds ratio
Single-item measure				
Wantedness				
Definitely no (r)	73	1.00	68	1.00
Probably no	8	0.91	18	2.64
Probably yes	19	} 9.68***	9	} 2.75
Definitely yes ^a	0		5	
Partner wantedness				
Definitely no (r)	49	1.00	53	1.00
Probably no	24	2.73**	20	1.69
Probably yes	17	3.69***	11	1.32
Definitely yes	10	4.65**	16	6.01***
Happiness				
Very unhappy (r)	40	1.00	29	1.00
Somewhat unhappy	28	1.39	29	1.78
Somewhat happy	19	0.88	20	0.78
Very happy	14	2.26*	22	6.76***
Likelihood				
No likelihood (r)	51	1.00	33	1.00
Low likelihood	25	1.21	30	1.31
Medium likelihood	10	1.45	17	2.93*
High likelihood	14	6.68***	20	6.32***
Dual-item measure				
Wantedness and partner's wantedness				
Neither want (r)	49	1.00	50	1.00
Partner only: some wantedness	24	2.50**	18	1.63

Pregnancy-intentions measure	Pregnancies (n = 72) among 263 girls		Pregnancies (n = 50) among partners of 181 boys	
	% of pregnancies	Odds ratio	% of pregnancies	Odds ratio
Respondent only: some wantedness ^b	0		2	
Both: some wantedness	27	4.11***	30	3.34*
Wantedness and happiness				
No wantedness nor happiness (r)	40	1.00	26	1.00
No wantedness, some happiness	33	0.90	42	1.31
Some wantedness, no happiness ^b	0		5	
Some wantedness and happiness	28	2.42*	28	3.38
Wantedness and likelihood				
No wantedness nor likelihood (r)	44	1.00	30	1.00
No wantedness, some likelihood	29	1.33	39	1.50
Some wantedness, no likelihood ^b	7		2	
Some wantedness and likelihood	20	3.15**	30	4.53**

* Significant at $p \leq 0.05$;

** $p \leq 0.01$;

*** $p \leq 0.001$. (r) = Reference category.

^a Category was collapsed with "probably yes" in calculation of OR.

^b Category was omitted in calculation of OR because too few pregnancies occurred.

Table 4

Among sexually active respondents, percentage of responses indicating use of a hormonal contraceptive or condoms six months later, by pregnancy-intentions measure, Mission Teen Health Project, San Francisco, California, 2001–04

Pregnancy-intentions measure	Percent using hormonal method	Percent using condom only	Percent not using	p-value ^a
Girls^b				
Wantedness				*
Definitely no	55.0	37.0	8.0	
Any wantedness	57.3	26.0	16.7	
Partner's wantedness				**
Definitely no	54.0	38.8	7.2	
Any wantedness	59.3	26.6	14.1	
Happiness				**
Very unhappy	53.3	40.9	5.8	
Any happiness	56.6	31.1	12.3	
Likelihood of pregnancy				
No likelihood	57.5	32.2	10.3	
Any likelihood	52.8	39.3	7.8	
Boys^c				
Wantedness				
Definitely no	60.2	34.0	5.8	
Any wantedness	60.3	32.8	6.9	
Partner's wantedness				
Definitely no	59.3	34.5	6.2	
Any wantedness	63.6	31.8	4.7	
Happiness				
Very unhappy	61.6	32.8	5.6	
Any happiness	59.2	34.9	5.9	
Likelihood of pregnancy				
No likelihood	57.4	35.2	7.4	
Any likelihood	63.0	32.4	4.6	
Total	55.8	35.8	8.4	

* Significant at $p \leq 0.05$;

** $p \leq 0.01$.

^aP-values compare contraceptive method by intention and are based on relative-risk ratios calculated using multinomial logistic regression, accounting for the clustering of observations within individuals.

^bResponses across 613 visits among 236 girls.

^cResponses across 471 visits among 189 boys.

Table 5

Percentage of participants' responses changing over six months and odds ratios of pregnancy another six months later, by pregnancy-intentions measure, Mission Teen Health Project, San Francisco, California, 2001–04

Pregnancy-intentions measure	Percent of responses (n = 769) among 373 girls and boys ^a	Odds ratio for subsequent pregnancy
Wantedness		
Decrease	8.3	0.51
No change (r)	82.0	1.00
Increase	9.7	2.81**
Partner's wantedness		
Decrease	15.2	0.61
No change (r)	68.2	1.00
Increase	16.7	3.50***
Happiness		
Decrease	16.4	1.01
No change (r)	59.4	1.00
Increase	24.2	1.32
Likelihood of pregnancy		
Decrease	21.3	0.83
No change (r)	60.3	1.00
Increase	18.4	2.43**

** Significant at $p \leq 0.01$;

*** $p \leq 0.001$. (r) = Reference category.

^a Analyses are pooled by sex because effects were similar between the sexes. Overall sample size is 769 observations because three visits were required to assess the effects of changes in intentions: first response, second response, and potential pregnancy at time of third response.

^b "Decrease" and "increase" refer to participants whose reported intentions decreased or increased by one or more steps on the Likert scale over two visits.

Note: Odds ratios are drawn from logistic regression models that account for the clustering of observations within individuals and include a cross-sectional effect (not shown) to control for overall intention level.