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Young Women's Perceptions of the Benefits of Childbearing: Associations with Contraceptive Use and Pregnancy

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Abstract

CONTEXT—High unintended pregnancy rates, and inconsistencies between reported pregnancy intentions and contraceptive behaviors, have been well documented among young U.S. women. Women's beliefs about the benefits of childbearing and motherhood may be related to the apparent disconnect between pregnancy intentions and reproductive outcomes.

METHODS—Perceived benefits of childbearing and feelings about a potential pregnancy were assessed among 1,377 women aged 15–24 (most of them black or Latina) participating in a longitudinal study in 2005–2008. The women, who were initiating hormonal contraception at public family planning clinics and did not want to become pregnant for one year, were followed for 12 months. Differences in perceived benefits of childbearing by participant characteristics were examined with linear regression, using a new multi-item measure. Cox proportional hazard regression was used to investigate the association of perceived benefits of childbearing with subsequent contraceptive discontinuation and pregnancy.

RESULTS—Perceptions of the benefits of childbearing decreased with increasing age (coefficient, -0.04), and white women perceived fewer benefits to childbearing than blacks (-0.2) and Latinas ($p = .01$). As women's perception of the benefits of childbearing increased, their one-year pregnancy rates increased, after demographic characteristics and feelings about a potential pregnancy were controlled for (hazard ratio, 1.2). Benefits of childbearing were not associated with contraceptive discontinuation.

CONCLUSIONS—To better assess pregnancy risk among young women wanting to avoid pregnancy, it may be useful to acknowledge that they hold not only explicit pregnancy desires, but also beliefs about the benefits of childbearing, which may influence sexual behavior and pregnancy.

Despite the availability of a range of contraceptive options in the United States, unintended pregnancy rates remain high, particularly among young women. According to the 2006–2008 National Survey of Family Growth (NSFG), 82% of pregnancies among adolescents and 64% among women aged 20–24 are unintended.¹ However, young women's pregnancy intentions are often inconsistent with their contraceptive behaviors.^{2–4} In a 2008–2009

representative survey of unmarried 18–29-year-olds in the United States, half of sexually active young women who were not planning to become pregnant either were not using contraceptives or were using a method inconsistently.⁵ In the 2006–2008 NSFG, 19% of adolescents and 14% of women aged 20–24 who were sexually active and did not want to become pregnant were not using a method.⁶ Unintended pregnancy can have significant consequences for both mother and child, and is indicative of unprotected sex and risk for STDs.⁷

While an extensive literature has identified barriers to contraceptive use that may explain these apparent inconsistencies,^{8,9} other research has focused on the idea that for some young women, ambivalence about pregnancy or positive views of motherhood reduce motivation to use contraceptives.^{2,3,10,11} Qualitative studies have revealed that although women are aware of the drawbacks of childbearing, they also perceive advantages. In a study conducted among black women, participants spoke about the benefits of having a baby, including that it would provide them with someone to love and an opportunity to assert responsibility; foster connections with boyfriends, friends and family; and restore their self-confidence.¹² Disadvantaged adolescents in other studies have said that teenage pregnancy would give them a purpose in life and allow them to become mothers while they were young and energetic.^{13,14} These attitudes may influence contraceptive use and pregnancy, even among young women who do not explicitly want to become pregnant. To fully understand why some women, particularly nulliparous young women, who do not desire pregnancy still do not use contraceptives effectively, it may be necessary to capture more subtle feelings, such as their perceptions of benefits of motherhood.

Scales measuring certain aspects of attitudes toward childbearing or motherhood have been proposed; however, none has been subjected to rigorous psychometric assessment, and most have focused on specific attitudinal dimensions, such as romanticized beliefs about pregnancy and parenthood,¹⁵ traditional versus liberal views of women's roles,^{16,17} postpartum women's identity as mothers¹⁸ and how parenting affects an individual's life.^{14,19–21} Most scales were developed among predominantly white, educated or nonadolescent populations of women, and are not appropriate for use among diverse populations of young women at highest risk for unintended pregnancy. Two scales, to our knowledge, have focused on high-risk youths' perceptions of the consequences of parenthood: the Positive Orientation Toward Early Motherhood scale, developed among black adolescents;¹⁹ and the Perceived Consequences of Teenage Childbearing scale, developed among high school students, most of whom were Latina.¹⁴ While these scales provide an important starting point, neither has undergone rigorous psychometric analysis, and neither has been assessed in relationship to subsequent reproductive health outcomes, such as contraceptive or sexual behavior or pregnancy.

For this study, we developed and validated a measure, the Benefits of Childbearing (BOC) scale, to assess perceived benefits to childbearing among a cohort of low-income urban females aged 15–24 who were seeking hormonal contraception. The study examines associations between young women's perceptions of benefits of childbearing and their contraceptive use and pregnancy experience over the next year. We hypothesized that women's beliefs about the benefits of childbearing would be positively associated with their rates of contraceptive discontinuation and pregnancy, even after their stated feelings about a potential pregnancy were controlled for.

METHODS

Conceptual Model

Most approaches to understanding pregnancy are grounded in a planned behavior framework:²² Women are viewed as formulating pregnancy intentions and as acting, to the extent possible, according to their intentions. Some researchers, however, have questioned whether this model fully captures pregnancy-related decision making.²³ A young woman's attitudes toward childbearing and pregnancy can be complex, encompassing a range of contradictory emotions; some young women who do not explicitly want to become pregnant still believe that a pregnancy would make them happy.² In this study, we take into account that attitudes, which are shaped by social, family and gender norms,^{12,24} may influence sexual and contraceptive behavior, even when individuals may not be consciously aware of them.^{25,26}

Study Design

Data were drawn from 1,377 adolescents and young women who were initiating hormonal contraception and participating in a longitudinal study of contraceptive use and pregnancy.²⁷ The study was conducted in 2005–2008 at four Planned Parenthood clinics in the San Francisco Bay Area. The clinics serve a racially diverse population of women who generally are low-income and have public or no medical insurance. Potential participants were referred to research assistants after their visit with a clinic provider, following standard clinic protocol, in which they elected to initiate a hormonal contraceptive method (the vaginal ring, patch, pill or injectable) for the first time. Women were eligible if they were 15–24 years old and unmarried, were English or Spanish speakers, were not pregnant and did not want to become pregnant in the next year. Because screening occurred after women had chosen to adopt a hormonal method, the cohort likely excluded women who wanted to participate in the study but who did not truly want to avoid pregnancy. Participants provided written informed consent, and study protocols were approved by the Committee on Human Research, University of California, San Francisco.

Participants completed self-administered questionnaires at baseline and at three, six and 12 months after baseline. The questionnaire was administered, in English or Spanish, via laptop computer (to reduce social desirability bias associated with interviewer-administered questionnaires). Ninety-four percent of participants completed the baseline interview at a clinic site, 3% completed the interview at a location more convenient for the participant and 2% were read the computer questionnaire over the phone by a research assistant. The baseline questionnaire included items on social and demographic characteristics, contraceptive use, pregnancy history, feelings about a potential pregnancy and childbearing attitudes. The follow-up questionnaires measured contraceptive discontinuation and pregnancies. Instruments were pilot-tested to ensure that they were at an appropriate reading level and understood by respondents. Urine pregnancy tests were performed at baseline and at the six- and 12-month visits. Participants received \$20–30 for completing each study visit.

Measures

Perceived benefits of childbearing were measured using the nine-item BOC scale. (See appendix for details on scale development.) Items were based on prior scales^{14,19} and formative qualitative research.²⁸ Respondents were asked the extent to which they agreed that having a baby would give them someone to love; would make them feel important; would help them keep the baby's father around; would help them get money from the baby's father; could get them out of a bad situation; would make them a woman; would make other people think they are important; would strengthen their relationship with the baby's father; and would mean that someone will love them. Responses were rated on a five-point scale

(0="strongly disagree," 1="disagree," 2="neither agree nor disagree," 3="agree" and 4="strongly agree"). Higher scores corresponded to more favorable beliefs about the benefits of childbearing. The scale had high internal consistency (separation reliability coefficient, 0.82) and validity. Scores were standardized for analyses.

Because some young women may have positive attitudes toward the prospect of pregnancy, even when they do not desire pregnancy,^{2,29} we assessed anticipated feelings about a hypothetical pregnancy. We used the following question on the baseline survey: "How would you feel if you got pregnant in the next three months (very upset, somewhat upset, I wouldn't care, somewhat pleased, very pleased, don't know)?" This question was placed near the end of the survey to minimize the degree to which participants would feel pressure to provide a negative response, having already stated that they did not desire pregnancy. For analyses, "don't know" responses were categorized with "I wouldn't care"; although these responses reflect different attitudes, they represent similar degrees of ambivalence.

The social and demographic variables assessed were age, race or ethnicity (black, Latina, white, Asian/Pacific Islander, mixed/other), mother's education (high school or less, more than high school), whether the respondent had a prior pregnancy, whether the respondent had any children, and school/employment status (in school or employed, neither in school nor employed). Participants who indicated they were of mixed heritage were asked with which racial or ethnic group they identified most and were categorized accordingly, because attitudes toward motherhood and childbearing are likely influenced by social and cultural norms that may be specific to different racial and ethnic groups.^{12,30}

Baseline measures also included the contraceptive method selected, interview mode and recruitment clinic.

The outcome variables for the prospective analyses were contraceptive discontinuation and pregnancy. Discontinuation of use of the hormonal method started at enrollment was measured by self-report at follow-up interviews. Incident pregnancies were captured by self-report, urine pregnancy test and clinic chart review. Each outcome variable was examined both as a simple dichotomous measure and as a "time to event" measure. We estimated the time to discontinuation or pregnancy by using the midpoint between the date of the interview at which it was reported and the date of the preceding interview.³¹ For example, if a participant was still using her contraceptive method at the three-month interview and reported discontinuation at her six-month interview, we estimated her time to discontinuation at 4.5 months.

To capture inconsistent method use and switching to other effective methods, we created an ordinal variable that categorized women as having continued their baseline method with no breaks in use; continued with breaks; switched to another effective method, with no breaks; switched to another effective method, with breaks; or discontinued and did not initiate use of another effective method. (If a woman did not report on her consistency of use, we considered her to have breaks in use.)

Analyses

Descriptive analyses explored participant characteristics, feelings about potentially becoming pregnant and BOC scale scores. The degree to which BOC scores correlated with women's stated feelings about a potential pregnancy was assessed using Spearman's rho³²; differences in mean score by feelings about a potential pregnancy were assessed in a linear regression model.*

We examined mean BOC scores by respondents' social and demographic characteristics and baseline contraceptive method. Bivariate and multivariate linear regression models, which controlled for interview mode and clinic site, were used to assess differences in mean scores between groups. Postestimation F tests were used to conduct pairwise comparisons by race or ethnicity and by contraceptive method.

We assessed the proportion of participants discontinuing their new method, and the proportion becoming pregnant, at each follow-up interview and over a year. We also calculated the overall discontinuation and pregnancy rates among all participants over a year.²⁷ Then, we used bivariate and multivariate Cox proportional hazard models to examine differences in these rates by perceived benefits of childbearing and feelings about a potential pregnancy. Multivariate models included the BOC and feelings about potential pregnancy variables, as well as social and demographic characteristics, clinic site, baseline contraceptive method and interview mode. Postestimation F tests were used to assess significance of differences between each pair of coefficients for categorical variables. Hazard analyses included the 1,309 participants who completed at least one follow-up visit. A participant contributed time to the analysis until she discontinued her hormonal contraceptive method or became pregnant, was lost to follow-up or exited the study at one year.

Because the analysis of contraceptive discontinuation did not capture women who used their methods inconsistently or switched to other effective methods, we also conducted ordinal logistic regression with the contraceptive use pattern variable as the outcome. To assess how accurately this variable might have captured women's actual use, we examined occurrence of pregnancy across contraceptive use patterns. We also used a Cox proportional hazard model to examine differences in pregnancy rates between the ordered categories of contraceptive use. All analyses were conducted in Stata, version 12.

RESULTS

On average, participants were 19.2 years old (standard deviation, 2.5). Two-thirds were adolescents, and one-third were aged 20–24 (Table 1). Overall, 41% identified as black, 29% as Latina, 13% as white, 12% as Asian or Pacific Islander, and 6% as mixed or other. Half of participants had ever been pregnant, and one in five had children. Forty-four percent reported that they would be very upset if they became pregnant. However, more than half of participants expressed some degree of ambivalence, saying they would be somewhat upset (25%), would not care or did not know (18%) or would be somewhat pleased (10%) about a potential pregnancy. Four percent said they would be very pleased.

Participants' raw BOC scores covered the full range of the scale (0–36), with a unimodal, right-skewed distribution and a cluster of individuals at zero. Standardized scores ranged from –3.1 to 4.3 and had a mean of zero. Participants most frequently agreed (either strongly or somewhat) that having a baby would give them someone to love (44%) and would mean somebody will love them (34%). They least often perceived that having a baby would help them get money from the father (5%) and would make other people think they are important (5%).

*FN A

Analyses assessing group differences in BOC scores by feelings about a potential pregnancy and demographic characteristics were also conducted by fitting explanatory item response models including terms for each group variable. Wald tests were used to determine the significance of group differences (source: De Boeck P and Wilson M, eds., *Explanatory Item Response Models: A Generalized Linear and Nonlinear Approach*, New York: Springer-Verlag, 2004). Results were unchanged from those presented.

When mean scores across the levels of feelings about a potential pregnancy were compared, scores were higher for those who would be somewhat upset, would not care or did not know, or would be somewhat pleased or very pleased by a pregnancy than for those who would be very upset if they were to become pregnant (coefficients, 0.5, 0.4, 0.6 and 0.7, respectively; $p < .001$ for each). Still, BOC scores varied widely among women within each level of the pregnancy feelings variable, and these two measures were moderately correlated (ρ , 0.23).

In an adjusted model, BOC scores varied by all participant characteristics except one: Scores were similar between women with and without children (Table 2). Our adjusted model indicated that the older a woman was, the fewer benefits of childbearing she perceived (coefficient, -0.04). Compared with black women, Asians and Pacific Islanders reported more benefits (0.3), and white women reported fewer (-0.2); Latinas reported levels of benefits similar to black women. Asians and Pacific Islanders, Latinas and black women all reported more benefits than white women. Participants whose mothers had more than a high school education reported fewer benefits than those whose mothers had less education (-0.1). Women who were in school or employed perceived more benefits than those who were neither in school nor employed (0.2). Scores were generally similar by contraceptive method adopted, except that women selecting the injectable perceived more benefits to childbearing than women starting the pill (0.2); women selecting the injectable also perceived more benefits than those starting the ring ($p < .01$). Perceptions of benefits did not differ by recruitment site or interview mode (not shown).

Over the course of the study, 75% of women who completed at least one follow-up visit discontinued their baseline hormonal contraceptive method, including 41% who discontinued within the first three months and 62% within six months. The discontinuation rate was 82 women per 100 person-years.²⁷ In an unadjusted proportional hazards model, as BOC score increased, the rate of contraceptive discontinuation increased (hazard ratio, 1.1; $p < .01$). Discontinuation rates generally did not vary by feelings about a potential pregnancy, but women who would be very pleased if they became pregnant had a higher discontinuation rate than those who would be very upset (1.5; $p < .05$).

In the model adjusting for social and demographic variables, the association between BOC score and contraceptive discontinuation was only marginally significant ($p = .07$), and anticipating feeling very pleased about a potential pregnancy was no longer significant (Table 3). The contraceptive discontinuation rate decreased by age, and white women experienced a lower discontinuation rate than both black women and women of mixed or other races. Women who chose the patch, the ring or the injectable at baseline discontinued use at higher rates than women who selected the pill; patch users discontinued at higher rates than women using the ring or injectable. When we repeated analyses using women's pattern of contraceptive use as the outcome (not shown), results were generally unchanged; however, women who would be very pleased about a pregnancy had less consistent patterns of use than those who would be very upset (odds ratio, 0.5; $p < .05$).

Overall, 22% of participants who completed a follow-up visit became pregnant during the study period, including 4% who became pregnant by three months and 11% by six months. The pregnancy rate was 23 per 100 person-years.²⁷ In an unadjusted model, as BOC score increased, so did the one-year pregnancy rate (hazard ratio, 1.2; $p < .01$). The pregnancy rate was higher for women who would feel very pleased by a pregnancy (2.6), who would not care or did not know (1.7), or who would feel somewhat upset (1.8) than for those who stated they would feel very upset by a pregnancy ($p < .001$ for each comparison); rates did not differ among these three groups.

The BOC was still associated with pregnancy after feelings about becoming pregnant and social and demographic variables were controlled for (hazard ratio, 1.2—Table 3). Compared with the rates for those who would be very upset by a pregnancy, pregnancy rates were higher among those who would feel very pleased (2.1), those who would not care or did not know (1.4), and, unexpectedly, those who would feel somewhat upset (1.7). Women who would be somewhat upset by a pregnancy had a higher pregnancy rate than women who would be somewhat pleased.

Asians and Pacific Islanders experienced a lower pregnancy rate than black women, Latinas, and women of mixed or other races. Women who already had children had a higher pregnancy rate than those without children. Finally, women using the patch or the ring experienced higher pregnancy rates than both pill and injectable users.

Contraceptive use pattern was strongly associated with pregnancy hazard ($p = .001$ —not shown). One-year risk of pregnancy declined as consistency of contraceptive use increased. Thirty-five percent of women who discontinued their baseline method and did not adopt another effective method became pregnant over a year, as did 25% of those who switched to another effective method, with breaks; 13% of those who switched to another method, with no breaks; 11% of those who continued the baseline method with breaks; and 6% of those who continued the baseline method with no breaks.

DISCUSSION

In this cohort of adolescent and young women adopting a hormonal contraceptive method, Benefits of Childbearing scale scores were positively associated with pregnancy, independent of women's verbalized feelings about their potentially becoming pregnant. Young women who perceive benefits to having a child may engage in behaviors that put them at risk for pregnancy, even if they state that they do not want to become pregnant and they seek hormonal contraceptives. This finding lends support to viewing pregnancy-related behaviors from more than a strict planned behavior perspective.^{2,23} To better assess risk of pregnancy among young women initiating hormonal contraception, it may be useful for providers to examine women's perceptions about childbearing, in addition to their stated pregnancy intentions.

It is intriguing that perceived benefits of childbearing and feelings about a potential pregnancy were associated with subsequent pregnancy, but they were not associated with contraceptive discontinuation in adjusted models. For women initiating a new contraceptive method, the primary risk factors for contraceptive discontinuation and actual pregnancy may be different. Even when they do not feel favorably about the prospect of pregnancy, women may discontinue methods more for reasons related to the methods themselves (e.g., side effects or beliefs about safety) than because of favorable attitudes about pregnancy or childbearing. Indeed, only 2% of women in this cohort who stopped using their selected method stated that they did so because they desired pregnancy; most cited side effects or access and cost barriers as their main reason.²⁷ It is also possible that our measures of contraceptive use may not have captured the complexity of inconsistent use and method switching; however, the strong negative association we observed between consistency of contraceptive use and pregnancy risk supports the validity of our contraceptive use pattern measure.

Although perceived benefits of childbearing were positively correlated with feelings about a potential pregnancy, BOC scores varied widely among women with similar feelings about pregnancy. For instance, even among those stating they would be very upset about a pregnancy, some agreed with all of the BOC items. Perceived benefits of childbearing and

feelings about a potential pregnancy are likely related but distinct constructs—one representing theoretical beliefs about the benefits of having a baby, and the other reflecting hypothetical feelings about becoming pregnant. Interestingly, although the women in this study were initiating hormonal contraceptive use, more than one in six would not care or did not know how they would feel if they became pregnant. Our results add to existing evidence that young women's feelings about having a baby can be complex, encompassing a range of potentially ambivalent attitudes.^{2,12}

BOC scores were elevated among nonwhites, women whose mothers had relatively little education and adolescents—subgroups who are at elevated risk of unintended pregnancy and abortion in the United States.¹ That Latinas and black women perceived more benefits to childbearing than white women is consistent with findings of racial and ethnic differences in young women's attitudes toward childbearing³³ and pregnancy.^{34–36} Research is needed to examine the roles that differences in attitudes about childbearing and pregnancy among racial, ethnic and socioeconomic groups might play in disparities in adolescent and unintended pregnancy.

We were somewhat surprised to find that perceptions of the benefits of childbearing declined as age increased, even though they did not differ between women with and without children. The only quantitative study we are aware of that has examined perceived advantages and disadvantages of childbearing by age included only teenagers, and it found no significant differences by age.¹⁴ A qualitative study among adolescents seeking prenatal care in Rhode Island found that those aged 17 and under tended to be more likely to view pregnancy as a way to enhance connections with others, while those aged 18–19 focused more on practical benefits of teenage motherhood versus having children later.¹³ Research has fairly consistently found age to be positively associated with favorable attitudes toward the prospect of pregnancy.^{34–36} Perhaps younger women, with less life experience, hold more idealistic views than their older counterparts of the benefits of childbearing, even if they do not want to become pregnant. Given that the proportion of pregnancies that are unintended is highest among adolescents,¹ examination of perceived benefits of childbearing might be particularly salient in this group.

BOC scores in this study were the same for women with and without children. However, for women at the same overall BOC score level, those with children were less likely to agree that having a baby would strengthen the relationship with the father than those without children (see appendix). Experience bearing and raising children may indicate that having a baby does not necessarily make women's relationships with their partners stronger. A more in-depth assessment of how benefits of childbearing items function differentially between women with and without children could be useful for identifying potentially unrealistic expectations about the benefits of having a child.

Limitations and Strengths

Several methodological factors limited our analyses. The initial list of BOC items included only two regarding potential drawbacks of childbearing. In another study, participants cited disadvantages and advantages of early childbearing,¹³ and contraceptive behavior and pregnancy risk may be shaped as much by disincentives to become pregnant as by perceived benefits.³⁷ In addition, because no prospective measures of pregnancy intention or attitudes have been developed,² we were limited to using an individual item to assess feelings about potentially becoming pregnant. The women in our cohort both did not desire pregnancy and were initiating hormonal contraceptive use. Our results may not be generalizable to women who are not presenting to clinics or initiating a new hormonal method, or to women outside the San Francisco Bay Area. Finally, some participants may have changed their attitudes toward becoming pregnant over time.

In spite of these limitations, our study has several strengths. The BOC scale was based on extensive qualitative research and analyzed using rigorous psychometric methods (see appendix). Although studies among U.S. teenagers have examined the relationships between pregnancy intentions and subsequent sexual behavior or pregnancy (with mixed results),^{2,3,29,36} we are not aware of other work that has prospectively assessed the predictive ability of attitudes about childbearing. Studies that have investigated the correlation between perceived benefits of childbearing and reproductive outcomes have been cross-sectional, examining attitudes about childbearing after sex¹⁴ or pregnancy¹⁹ has occurred; participants' feelings about the benefits of childbearing likely were influenced by these events. By assessing perceived benefits of childbearing and feelings about a potential pregnancy prospectively, we have established that the attitudes existed prior to pregnancy and were not influenced by the pregnancy itself. Our study is also unique in that it assessed the independent associations between perceived benefits of childbearing and our outcomes.

Conclusion

Our findings highlight the complexity of helping young women prevent pregnancy. Efforts to increase contraceptive adoption and continuation may be thwarted if we fail to acknowledge that young women hold not only explicit pregnancy desires, but also beliefs about the benefits of having a child, which may influence sexual behavior and pregnancy risk. Future research might investigate the performance of a tool like the BOC in clinical settings to determine if it might inform interventions that can help young women achieve their goals of delayed or prevented pregnancy.

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APPENDIX

Our aim was to develop a measure of childbearing attitudes that is reliable, valid and appropriate for use among diverse populations of young U.S. women at high risk of unintended pregnancy. We implemented a three-stage design: item development, initial item selection and final measure performance assessment. Analyses included the 1,377 cohort members who completed the BOC items. Analyses were conducted using ACER ConQuest, version 2.0, and were consistent with guidelines for psychometric testing of a new instrument.³⁸

Item Development

We used methods based on item response theory to evaluate the scale. Item response theory uses logistic random intercept models to determine the properties of scale items, assess scale performance and place individuals along a continuum of the latent variable.^{39–41} The idea behind this theory is that individuals respond to items on the basis of their attitude level. For example, the more benefits of childbearing a woman perceives, the higher her probability of agreeing with an item naming a potential benefit of childbearing. Item response theory offers advantages over traditional scale evaluation methods that are based on classical test theory.^{41–43} For instance, it allows for variation in the distances between response categories for an item (e.g., the difference between “agree” and “disagree” can be greater than the difference between “strongly agree” and “agree”) and between items (a partial credit model).⁴⁴ Differential item functioning between groups of individuals can be examined to identify potentially biased items.

Benefits of childbearing items were developed on the basis of formative qualitative research; 16 focus groups were conducted with 113 women aged 15–26 of multiple races.²⁸ We also included items from the Positive Orientation Toward Early Motherhood scale¹⁹ and the Perceived Consequences of Teenage Childbearing scale¹⁴ if the attitudes they assessed were prevalent in the focus groups. We developed 15 Likert-scaled items for potential use in the BOC (see box); total scores ranged from 0 (least favorable beliefs about the benefits of childbearing) to 36 (most favorable).

Initial Item Selection

We followed several steps to select from the 15 original items those that would remain in the scale. We fitted items to a unidimensional partial credit item response model⁴⁴ and assessed their fit; a weighted mean square statistic of less than 1.33 was considered an acceptable fit. To examine whether items might better be treated multidimensionally, we also fitted a multidimensional item response model, dividing items by whether they reflected emotional or practical benefits. The fit was not substantially improved, and we used the more parsimonious unidimensional model.

The scale’s internal consistency was assessed with the separation reliability coefficient, which is analogous to Cronbach’s alpha. For initial item selection, we ranked items by fit and incrementally added items to the model, starting with the best fitting ones, until reliability no longer increased.

To assess internal structure validity, we plotted women’s BOC scores on a scale next to “item-threshold levels,” representing the level of perceived benefits of childbearing a woman would need to have a 50% chance of selecting a response category falling on either side of the threshold (e.g., “strongly disagree” vs. any other response). We examined the plot to be sure that items captured the range of participants’ attitudes. We ensured that women endorsing each increasing response option on each item had increasing scores on the scale. Finally, we plotted the frequency with which each item’s response categories were selected along the range of overall BOC scores (item characteristic curves). Items with response categories that were the most common along large ranges of the—scale or those that were never the most common were—removed.

All items fit the item response model and exhibited good internal structure validity: Women endorsing each increasing response option on each item had increasing scores on the BOC scale. However, six items were removed from the final scale. “Being a mother is special” and “a baby is a blessing” were removed because few participants disagreed; thus, most

thresholds fell below participant levels. “Babies take a lot of time and cost a lot” and “a baby is a lot of work” were removed because the large majority of respondents agreed. When we added these four items, as well as “having a baby would help me get money from the government” and “if...I love the guy, I would have his baby,” to the scale, the reliability of the scale was reduced. We thus removed the items.

Final Measure Performance Assessment

We established the final scale’s psychometric properties by fitting the nine final items to a new item response model and assessing item fit, reliability and internal structure validity using the same steps outlined above. In addition, we assessed differential item functioning, which indicates that an item in a scale performs differently among groups of women who otherwise score similarly on the scale. The presence of differential item functioning can indicate that an item is biased, but it can also provide insight into group differences on an item. To assess differential item functioning, we introduced interaction terms between items and each social and demographic variable to nested models with a random intercept for the social or demographic subgroup alone. We determined, a priori, that a 0.33 logit difference in item-by-trait coefficients between groups represented a meaningful difference and warranted removal of the item from the final scale.^{45,46}

Participants’ raw BOC scores covered the full range of the scale (0–36), with a unimodal, right-skewed distribution and a cluster of individuals at zero. On the scale generated by item response theory, scores ranged from –5 to 5 (mean, –0.9). Items and their response categories covered the range of participants’ childbearing attitudes, indicating that the items were appropriate for the population being studied. All nine items fit the model.

The separation reliability of the final scale was high (0.82). Most criteria for internal structure validity were met. Participants selecting increasing response options on each item had increasing scores on the BOC scale. For instance, women responding “strongly disagree” to each item had lower average overall BOC scores than those responding “disagree.” In general, each possible response option was the most common response among women at the appropriate range of the BOC scale, i.e. “strongly disagree” was the most frequent response among women with the lowest BOC scores and “strongly agree” was most common among those with the highest BOC scores. However, for four items, “strongly agree” and “agree” were not the most endorsed responses for women at the corresponding range of the scale, largely because few women agreed with these statements. These items reflected the belief that having a baby would help the woman keep the baby’s father around, would help her get money from him, could get her out of a bad situation and would make other people think she is important.

We detected no differential item functioning for any items by age-group, race or ethnicity, or maternal education. Items performed nondifferentially between women with and without children, with one exception: Women with children were less likely than women without children who had the same overall BOC score to agree that having a baby would strengthen the relationship with the father. We speculate that this finding is due to these women’s relationship experiences after having a child rather than to a meaningful difference in how women conceptualize childbearing and motherhood.

Because we conducted our psychometric analysis of the BOC within a longitudinal study designed to answer the primary research questions, we were unable to assess short-term test-retest reliability, and we used the same study population for initial item selection¹¹ and the final psychometric analysis. Analyses should be repeated in other populations to verify our results. However, because the BOC was developed in a racially diverse population of

adolescents and women aged 20–24, the scale may be better suited to capture childbearing attitudes in nonadolescent and racially diverse populations than are scales that were developed among adolescents only and focused on one racial or ethnic group.^{14,19}

Benefits of Childbearing scale items

Final scale items

Having a baby would give me someone to love.
Having a baby would make me feel important.
Having a baby would help me keep the baby's father around.
Having a baby would help me get money from the baby's father.
Having a baby could get me out of a bad situation.
Having a baby would make me a woman.
Having a baby would make other people think I am important.
Having a baby would make my relationship with the baby's father stronger.
Having a baby means somebody will love me.

Items considered but removed

Being a mother is special.
A baby is a blessing.
A baby is a lot of work.
Babies take a lot of time and cost a lot.
Having a baby would help me get money from the government.
If I get pregnant and I love the guy, I would have his baby.

Note: Participants rated each item on a Likert scale with response options of "strongly agree," "agree," "neither disagree nor agree," "disagree" and "strongly disagree."

TABLE 1

Percentage distribution of women aged 15–24 participating in a longitudinal study of hormonal contraceptive use and pregnancy, by selected characteristics, San Francisco Bay Area, 2005–2008

Characteristic	% (N=1,377)
Age	
15–17	35.4
18–19	31.8
20–24	32.8
Race/ethnicity	
Black	40.8
Latina	29.0
White	12.7
Asian/Pacific Islander	11.9
Mixed/other	5.6
Mother's education	
high school	60.6
>high school	39.4
Prior pregnancy	
No	51.2
Yes	48.8
Has any children	
No	80.2
Yes	19.8
School/employment status	
Neither in school nor employed	17.4
In school or employed	82.6
Baseline contraceptive method	
Pill	31.1
Patch	28.8
Ring	18.7
Injectable	21.4
Feeling if became pregnant	
Very upset	43.6
Somewhat upset	24.8
Wouldn't care/don't know	18.3
Somewhat pleased	9.8
Very pleased	3.5
Total	100.0

TABLE 2

Mean scores on the Benefits of Childbearing scale, and coefficients (and 95% confidence intervals) from multivariate regression analyses assessing differences in mean scores, by selected participant characteristics

Characteristic	Mean score	Coefficient
Age	na	-0.04 (-0.07 to -0.02) ***
Race/ethnicity		
Black	-0.01	ref
Latina	0.05	0.04 (-0.10-0.17) [‡]
White	-0.23	-0.20 (-0.38 to -0.03) [*]
Asian/Pacific Islander	0.21	0.28 (0.10-0.47) **,‡
Mixed/other	-0.01	0.02 (-0.22-0.25)
Mother's education		
high school	0.07	ref
>high school	-0.12	-0.14 (-0.25 to -0.03) [*]
Has any children		
No	0.00	ref
Yes	0.01	0.03 (-0.11-0.18)
School/employment status		
Neither in school nor employed	-0.03	ref
In school or employed	0.13	0.21 (0.06-0.35) **
Baseline contraceptive method		
Pill	-0.05	ref
Patch	0.06	0.12 (-0.02-0.26)
Ring	0.13	-0.04 (-0.19-0.12)
Injectable	-0.16	0.20 (0.05-0.34) **,§

* p .05.

** p .01.

*** p .001.

[‡] Differs from white and Asian/Pacific Islander at p .01.

[‡] Differs from white at p .001.

[§] Differs from ring at p .01.

Notes: Scores were standardized for regression analyses (mean, 0; standard deviation, 1; range, -3.1-4.3). The model controls for recruitment clinic and interview mode; scores did not differ by these variables. na=not applicable. ref=reference group.

TABLE 3

Adjusted hazard ratios (and 95% confidence intervals) from multivariate analyses assessing rates of contraceptive discontinuation and pregnancy over one year, by selected participant characteristics

Characteristic	Contraceptive discontinuation	Pregnancy
Perceived benefits of childbearing	1.07 (0.99–1.14)	1.17 (1.02–1.34)*
Feeling if became pregnant		
Very upset (ref)	1.00	1.00
Somewhat upset	1.00 (0.85–1.18)	1.66 (1.23–2.22)***,§
Wouldn't care/don't know	1.01 (0.85–1.22)	1.43 (1.02–2.00)*
Somewhat pleased	0.93 (0.73–1.18)	1.02 (0.63–1.64)
Very pleased	1.19 (0.84–1.69)	2.09 (1.21–3.62)**
Age	0.96 (0.93–0.99)**	0.98 (0.93–1.03)
Race/ethnicity		
Black (ref)	1.00	1.00
Latina	0.92 (0.78–1.08)	0.85 (0.63–1.13)
White	0.73 (0.59–0.92)**, [†]	0.67 (0.42–1.07)
Asian/Pacific Islander	0.87 (0.69–1.09)	0.35 (0.19–0.63)***, ^{††}
Mixed/other	1.05 (0.79–1.38)	1.02 (0.61–1.70)
Mother's education >high school	1.12 (0.98–1.28)	1.19 (0.93–1.53)
Has any children	1.13 (0.95–1.34)	1.60 (1.19–2.14)**
In school or employed	1.15 (0.96–1.38)	1.16 (0.85–1.57)
Baseline contraceptive method		
Pill (ref)	1.00	1.00
Patch	1.97 (1.66–2.34)***, [‡]	1.74 (1.27–2.39)***, ^{‡‡}
Ring	1.24 (1.02–1.52)*	2.00 (1.40–2.84)***, ^{‡‡}
Injectable	1.29 (1.08–1.55)**	0.82 (0.55–1.22)

* p .05.

** p .01.

*** p .001.

[†] Differs from mixed/other at p .05.

[‡] Differs from ring and injectable at p .001.

[§] Differs from somewhat pleased at p .05.

^{††} Differs from Latina and mixed/other at p .01.

^{‡‡} Differs from injectable at p .001.

Notes: Tests of significance are two-tailed. The models control for recruitment clinic and interview mode.