

Bowling Green State University
The Center for Family and Demographic Research

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2012 Working Paper Series

**AMBIVALENCE TOWARDS PREGNANCY:
IS IT A SINGULAR OR MULTIFACETED CONCEPT?**

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April 3, 2012

Running head: Ambivalence towards pregnancy

Keywords: pregnancy attitudes, ambivalence, contraception, fertility

5523 words (text only)

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ABSTRACT (250 words)

CONTEXT: Ambivalence towards pregnancy is a widespread phenomenon with potential importance for understanding contraceptive behavior and measuring unintended pregnancy. Ambivalence may be operationalized as either a neutral attitude toward pregnancy or having conflicting attitudes. Previous research has focused on ambivalence as a neutral attitude, while conflicted ambivalence is less well understood.

METHODS: We used data from a recent nationally representative survey of unmarried young adults, the “Fog Zone” survey (N=1,800; analytic sample, N=1,147). Based on two measures of attitudes toward becoming pregnant, the importance of avoiding pregnancy and predicted happiness about a pregnancy, we formed a categorical ambivalence measure considering both the presence and direction of conflicting attitudes: negative consistency, positive ambivalence (important to avoid pregnancy and happy about pregnancy), negative ambivalence (not important to avoid and unhappy), and positive consistency. Multinomial logit and logistic regression analyses were used to explore the characteristics associated with ambivalence and to examine whether ambivalence is associated with inconsistent use of contraceptives.

RESULTS: Both consistency in attitudes toward pregnancy and ambivalence are patterned by race-ethnicity, age, education, and gender. Women with negative ambivalence were strongly less likely to use contraceptives consistently than those with negative consistency. In contrast, women with positive ambivalence do not differ from the majority of young women who want to avoid pregnancy. For males, ambivalence does not predict consistent use of contraceptives.

CONCLUSION: Ambivalence is not a singular but multifaceted concept. Women with negative ambivalence rather than positive ambivalence should be a main target of prevention programs and related policies.

INTRODUCTION

Many people have mixed or inconsistent attitudes towards pregnancy and childbearing (Edin et al. 2007; Jaccard, Dodge, and Dittus 2003; Luker 1999; Zabin, Astone, and Emerson 1993; Zabin 1999). It is possible, and indeed appears common, to feel positively toward children in general while being reluctant to have a child at a particular time, or to recognize costs of fertility even while wanting to have a baby. The widespread presence of mixed feelings about pregnancy has been proposed as an explanation for the non-use of contraception among women and couples who do not actively want to become pregnant. Many studies have used pregnancy ambivalence to predict contraceptive behavior or to measure unintended pregnancy, and it is well-known that pregnancy ambivalence is tied to non-use and inconsistent use of contraceptives as well as unintended pregnancy (Frost et al. 2008; McQuillan, Greil, and Shreffler, 2010; Santelli et al. 2003; Zabin et al. 1993; Zabin 1999). Ambivalence on pregnancy has attracted much attention in pregnancy prevention programs for adolescents (e.g. Sheeder et al., 2010 and Jaccard et al. 2003). In general, around one third of women have ambivalent feelings about pregnancy, and they are significantly less likely to use contraceptives consistently than women with consistent negative attitudes (Hohmann-Marriott 2011; Sable and Libbus 2000; Trussell et al. 1999). Ambivalence on pregnancy also may result in poor health outcomes and lower well-being of children (Brown et al. 1995; Mohllajee et al. 2007).

Despite these findings demonstrating the importance of ambivalence, questions remain on how to measure the concept. In fact, it is still not clear what ambivalence means exactly. Is it a neutral or undetermined state about pregnancy? Or does it indicate a more complex state reflecting internal conflicts on pregnancy? The word of ambivalence itself connotes both 1)

uncertainty and 2) coexistence of conflicting feelings. As far as pregnancy ambivalence, most previous studies have focused on the former. In many cases a set of neutral responses of Likert scale questions or an average of two or more scales is used to define the concept, with any mid-range score considered to be ambivalence. In contrast to this body of work, we focus on conflicting attitudes. As described above, women may provide discordant or even contradictory responses across different dimensions of pregnancy or for a certain time-interval. If questions reflect different cognitive and emotional aspects, conflict across questions – i.e., ambivalence – is likely to occur. Though a few studies focus on this incongruent type of ambivalence (Hohmann-Marriott 2011; Sable and Libbus 2000; Trussell et al. 1999), it has been missed or underestimated in many empirical studies. One reason for gaps in the existing literature is that ambivalence from conflicting feelings is often derived post hoc through retrospective attitudinal and behavioral questions, where individuals are asked about a birth that has already occurred, inquiring whether they were trying to get pregnant at the time and whether they were using contraceptives when they got pregnant (Joyce, Kaestner, and Korenman 2002; Williams et al. 2001). Ambivalence in these cases is usually defined based on behavior – for example, a woman saying she was not trying to get pregnant but not using contraception – rather than attitudes, which may not be the best way to measure ambivalence

Pregnancy ambivalence is not a homogeneous concept. Let us suppose, for example, there are two women. One woman says she would be happy with pregnancy (perhaps because she believes all children are a blessing) even though she also believes avoiding pregnancy is important at her current life stage. The other woman would be unhappy with a pregnancy (perhaps because she is unsure whether she wants to have children) even though having a child right now would not be particularly disruptive to her life. These two women are substantially

different from each other. Nonetheless, both would be categorized as ambivalent, lumped together as a homogenous group by standard classification. In categorizing both as ambivalent, research may obscure the relationship between women's feelings and motivation and their subsequent contraceptive and sexual behavior. In fact, although the existence of women with these feelings has long been recognized (Klerman 2000; Trussell et al. 1999; Zabin 1999), different types of ambivalence have not been distinguished properly in empirical research. To our knowledge, no previous study has regarded ambivalence as involving multiple categories, and studies have overwhelmingly ignored men. We argue that ambivalence is not a singular but multifaceted concept, and it is important to understand actual aspects of ambivalence among both men and women.

In the current study, we suggest that ambivalence on pregnancy has multiple dimensions which may lead to inconsistent use of contraceptives. Using data from a recent survey of unmarried young adults who are sexually active, we explore the characteristics that are associated with ambivalence toward pregnancy and investigate whether ambivalence is associated with inconsistent use of contraceptives. To measure ambivalence, we use two distinct aspects of attitudes toward pregnancy: perceived importance of avoiding pregnancy and feelings about a hypothetical pregnancy. We create an ambivalence measure with four categories: negative consistency (important to avoid a pregnancy and would be upset if a pregnancy occurred), positive ambivalence (important to avoid but would be pleased), negative ambivalence (not important to avoid but would be upset), and positive consistency (not important to avoid and would be pleased). Combining motivation and emotion about pregnancy, we then estimate the likelihood of contraceptive behavior.

Ambivalence on Pregnancy

Research on ambivalence examines issues ranging from the relationship between attitudes toward pregnancy and contraception to the link between measurement of unintended pregnancy and pregnancy outcomes. The former body of research has mainly predicted the risk of pregnancy, mostly focusing on adolescents and early adulthood. The studies in this area examine whether ambivalence leads to inconsistent use or nonuse of contraceptives for pregnancy prevention program. It is assumed that to motivate contraceptive use, the “strength” of intention for avoiding pregnancy is important (Zabin et al. 1993; Zabin 1999). Thus, either neutral or midscale responses in questions about pregnancy are usually regarded as ambivalence.

The second approach is about determining whether or not pregnancy is intended. Studies in this area have been used to determine if women wanted to become pregnant at a certain time in order to identify unintended pregnancy (Klerman 2000). Because pregnancy outcomes or well-being of children are usually the main interest of this research, the sample is usually women who become pregnant or give birth. In this area, a few studies have begun to explore an incongruent ambivalence between intention and emotion, as a substantial minority of women with unintended fertility nonetheless report that they were happy about their pregnancy (Hohmann-Marriott 2011; Sable and Libbus 2000; Stanford et al. 2000; Trussell, Vaughan, and Stanford 1999). Based on the 1995 National Survey Family Growth (NSFG), Trussell and colleagues (1999) reported that about 31% of pregnancies resulting from a contraceptive failure were classified as intended. Surprisingly, 25% of women who had an unintended birth after a contraceptive failure also said they were “happy” or “very happy” with their pregnancy. Sable and Libbus (2000) investigated women who were seeking pregnancy testing at a clinic. Of the

women in their sample who said they did not intend their pregnancy, almost half reported they were not contracepting consistently. Analyzing two large datasets from the U.K. and the U.S., one recent study reported that one third of mothers had ambivalence across cognition, emotion and behavior (Hohmann-Marriott 2011).

Still, the incongruent type of ambivalence has not been fully explored yet, with several research gaps with regard to ambivalence on pregnancy. First, previous studies have not always recognized that ambivalence can take different forms. For example, one might say avoiding pregnancy is important but would still be happy if a pregnancy occurred. In contrast, another might say it is not important but would be upset with pregnancy. The former substantially differs from the latter: the former seems close to the situation of a ‘mistimed’ pregnancy with contraception if the hypothetical pregnancy occurs, whereas the latter is more likely resembles an ‘unwanted’ pregnancy if one were to occur. Nonetheless, research focused on ambivalence usually does not differentiate between the two types. Second, there is an age gap among the two areas of studies on ambivalence. Research on ambivalence and contraception often focuses on adolescents, whereas research on pregnancy outcomes concentrates on mothers who gave birth. Ambivalence of young adults, particularly those in their twenties, has not been fully covered in previous studies; this is especially problematic given high rates of both nonmarital and unintended fertility among this group. Third, there simply are not enough studies on ambivalence. Indeed, considering the incongruent type of ambivalence in empirical studies is rare. The few existing studies on the incongruity failed to find the meaning of incongruity (Sheeder et al., 2010) or just provided characteristics of women who have ambivalence on pregnancy (Hohmann-Marriott 2011; McQuillan et al. 2010). Fourth, because most studies are retrospective reports among women have who given birth, given well-known problems with

fertility reporting among men (Joyner et al. 2012), most studies have ignored men's attitudes toward pregnancy and birth. Finally, the few studies that recognize variation in ambivalence used retrospective reports among those who have already had children, rather than looking at all individuals (Hohmann-Marriott 2011; Sable and Libbus 2000; Stanford et al. 2000; Trussell, Vaughan, and Stanford 1999).

More importantly, it is still not clear why people have ambivalence toward pregnancy. Though previous studies suggested ambivalence exists and reflects the multidimensional nature of intentions and feelings toward pregnancy, ambivalence is not fully understood. In general, it appears that African American or Hispanic women are more likely to report conflicting attitudes and inconsistent contraceptive behavior than non-Hispanic White women (McQuillan et al. 2010; Kaye, Suellentrop, and Stroup 2009). Hohmann-Marriott (2011) also reported that mothers with ambivalence on pregnancy are younger, have lower education, and are more likely to be race/ethnic minorities. However, it is uncertain if the difference in ambivalence is due to race/ethnic differences per se or differences in socioeconomic status. Since many studies on ambivalence targeted adolescents, lack of cognitive development has been pointed out as a cause of ambivalence (Steinberg 2007). It might be the case that adolescents do not have well-developed preferences or have little experience translating intentions into contraceptive behavior; if this is the case, we would expect ambivalence to decline as age and education increases. Economic hardship such as unemployment is also important because it may affect access to contraceptive use and motivation for pregnancy (McQuillan et al. 2010).

Personal beliefs and experiences related to childbearing, sex experience, and social environment likely affect having ambivalent attitudes. People who have strong pronatalist beliefs in the abstract are more likely to be happy about a pregnancy even if they do not feel that their

current life stage is the ideal time to begin childbearing. Personal characteristics and experiences, such as relationship status, already having children, and past pregnancies, may also affect ambivalence, since they alter interpretations of the positive and negative consequences of childbearing. For those who are currently in a sexual relationship, the risk of pregnancy is more immediate, so individuals have likely given some thought to pregnancy risk and contraception . At the same time, some of them might think getting pregnant could strengthen their relationship, that their partner would make a good co-parent, or simply that a pregnancy is a natural outcome of a stable, committed union (Edin et al. 2007).

Focusing on the incongruent type of ambivalence, this study examines 1) what characteristics are associated with having ambivalent attitudes toward pregnancy, and 2) whether ambivalent attitudes predict inconsistent contraceptive use, net of these characteristics. Using a recent survey of unmarried young adults, this study classifies young adults' attitudes toward pregnancy into four different groups. This classification allows us to both consider variation in ambivalence and assess the association between ambivalence and contraception in a more refined manner than prior work.

METHODS

Data and Measures

This analysis uses the 2009 Survey of Unmarried Young Adults' Contraceptive Knowledge and Practices (the "Fog Zone" survey), collected by The National Campaign to Prevent Teen and Unintended Pregnancy in collaboration with the Guttmacher Institute (Kaye, Suellentrop, and Sloup, 2009). With a complex survey design, the data are a nationally representative probability-based sample of unmarried young adults aged 18-29 in 2009. Because births to unmarried women are more likely to be unintended in the U.S. (Hayford and Guzzo

2010), it is useful to understand ambivalence and its relevance to contraception among the population most at risk for an unintended birth. The sample consists of 897 women and 903 men, a total of 1,800 respondents. We only use those who were sexually active in the last 12 months (excluding n=478), were not sterilized (n=19), were not currently pregnant (n=45) and were not currently trying to get pregnant (n=55). Thus, our sample is restricted to the 1,203 sexually active unmarried young adults aged 18-29.

Our analyses focus on ambivalence toward pregnancy and contraceptive use. In order to reflect the incongruent type of ambivalence in this study, we use a simple classification with two dimensions of attitudes toward pregnancy: importance of avoiding pregnancy and feelings about pregnancy. Importance of avoiding pregnancy was phrased: “Thinking about your life right now, how important is it for you to avoid becoming pregnant (getting someone pregnant)?” It is measured on a scale of 1 “very important” to 4 “not important.” Both “very important” and “important” were combined to produce a dichotomous variable. Feelings about a hypothetical pregnancy were also asked: “How would you feel today if you found out you were pregnant (your partner were pregnant)?” It is also measured on a scale of 1 “very upset” to 4 “very pleased.” In the same way, we regrouped “very upset” and “upset” into dichotomous variable: “upset” or not. For these two measures, 92 cases were missing, including “refused to answer, “don’t know” or “wouldn’t care.” In this survey, the option of neutral responses was not offered to respondents; however, if they nonetheless gave a neutral response (“don’t know” or “wouldn’t care”), those were recorded. We excluded these cases to focus on the purpose of this study. An additional 6 cases were missing in various control variables. The final sample size for analyses is 1,147.

Contraceptive use is measured using a constructed variable that indicates whether respondents were “well protected” from the risk of pregnancy over the past three months.¹ This measure is derived from responses to questions regarding contraceptive methods used and the consistency of use during the three months prior to the survey. Respondents are categorized as “well protected – consistent use” if they reported using oral contraceptives, condoms, Depo-Provera, or a long-acting method (e.g., IUD) consistently and correctly during the past three months. Respondents are categorized as “unprotected – inconsistent use or nonusers” if they were sexually active but were not using a method, skipped pills, were late with a Depo-Provera shot, or did not use a condom every time they had sex. The third category, “uncertain status – consistency or sex unknown” was used for respondents who reported using a different method than those considered as protective (e.g, withdrawal, contraceptive foam, etc.) and for respondents who did not report using a method and who reported having sex in the past year but did not respond to questions about sex in the past three months. Because the “uncertain status” category primarily includes respondents who reported using less-effective methods, we treated these respondents as not well-protected. Our analysis therefore analyzes contraceptive protection status as a dichotomous variable, well-protected and not well-protected. In exploratory analysis, we found similar results when excluding respondents in the uncertain protection status category. Since the data used here is cross-sectional, with contraceptive use measured during the three months before the survey, we are unable to determine the direction of causality between ambivalent attitudes and contraceptive use. These results are nevertheless useful in pointing to important associations.

¹ The term “well protected” and the categorization of this variable is the same as used in the original Fog Zone report published by The National Campaign to Prevent Teen Pregnancy (Kaye, Suellentrop, and Sloup, 2009). We use it here for consistency across reports using these data.

We combined the motivation and happiness questions to create an ambivalence measure with four categories based on incongruence across the two questions: negative consistency, positive ambivalence, negative ambivalence, and positive consistency (see Table 1). Positive ambivalence refers to those who report that avoiding pregnancy is important but getting pregnant would make them pleased, implying positive feelings about pregnancy. Negative ambivalence refers to those who say avoiding pregnancy is not important, but they would be upset with pregnancy. In the same way, those who expressed congruent or consistent attitude toward pregnancy also can be distinguished into two groups: positive and negative consistency, with the former generally open to the idea of a pregnancy and the latter against a pregnancy at the time. Note that because our sample is restricted to respondents who are not trying to get pregnant, even those who report consistently positive responses on the two measures in fact exhibit some level of ambivalence. We hypothesize that those who have negatively consistent attitudes toward pregnancy are most likely to use well-protected contraception. The positively consistent group would be the least likely to be protected by secure contraception. We also expect that the levels of contraceptive use for two ambivalence groups are between those for the two consistent groups. In addition, we hypothesize that positive ambivalence is more associated with consistent use of contraceptives than negative ambivalence because the cognitive measure (importance of avoiding pregnancy) may be more associated with planned actions (using contraception) than the emotional measure. Thus, the hypothesized order of protection status is negative consistency, positive ambivalence, negative ambivalence, and positive consistency, in turn. The ambivalence measure helps us to identify the characteristics of each group and compare contraceptive protection status. With this measure, we provide a better understanding of ambivalence on pregnancy and how it affects contraceptive use.

<Table 1 about here>

Analysis

We conduct two sets of analyses to answer our research questions. The first set investigates the determinants of ambivalent or consistent attitudes toward pregnancy, using multinomial logistic regression with the four ambivalence categories. The second set of analyses examines whether these ambivalence categories are associated with consistent contraceptive use. For this set of analyses, results are presented for females and males separately. In general, female and males have substantially different attitudes and behavior on contraceptive use (Fennell 2011). In addition, exploratory analyses suggested that gender differences in the association between attitudes toward pregnancy and contraceptive behavior were large and patterned differently. In both analyses, we control for characteristics shown to be related to ambivalence and contraceptive use in prior research: sociodemographic variables, (age, gender, race/ethnicity, education, employment/enrollment status), personal beliefs about children (every pregnancy is a blessing), and sex and fertility experience (currently in sexual relationship, has children, ever had sexual education).

RESULTS

Descriptive Results

Table 2 shows weighted descriptive statistics of major variables by four categories of ambivalence and for the sample as a whole. A slight majority (58.1%) of the sample reports negative consistency, with just under a third reporting positive consistency. About 33.1% have ambivalence of some sort, but positive ambivalence is far more common than negative ambivalence. Of the analytic sample, 30.3% reports positive ambivalence, and only 2.8% report

negative ambivalence. The majority of the sample is non-Hispanic white (60.1%). On average the sample is around 22.8 years old, and 53.2% are male. Around three fourths of the sample (76.9%) thought every pregnancy is a blessing. Regarding personal experience, about two thirds are currently in a sexual union, one fourth of the sample has at least one child (24.4%), and the majority of the sample received sex education (79.8%).

The proportions of several variables significantly vary across four ambivalence categories. Compared to other race-ethnicity groups, more Hispanics express positive ambivalence, at 51.0%. Women are more likely to be in the negative consistency group – those we expect to be most likely to use contraception – whereas males tend to have more ambivalence (of any kind) than females ($p < .001$). Educational attainment and current work status also differ across four categories. Those who believe every pregnancy is a blessing tend to have more positive consistency and positive ambivalence ($p < .001$).

<Table 2 about here>

Multivariate Results: Characteristics of Ambivalence

To identify characteristics associated with ambivalence among unmarried young adults, we conducted multinomial logistic regression of the ambivalence measure (Table 3).

Sociodemographic variables, personal beliefs, and sexual and fertility experiences are used in analytic models as independent variables. In table 3, the reference group is negative consistency, the modal category - important to avoid pregnancy and would be upset if became pregnant. We first describe the results for positive ambivalence and then for negative ambivalence. Because our main focus is on ambivalence, we do not discuss results for positive consistency.

As suggested by the bivariate results, women are significantly less likely to report ambivalence. When comparing positive ambivalence with negative consistency, we see statistically significant differences across race-ethnicity. Compared to non-Hispanic whites, non-Hispanic blacks are less likely to have positive ambivalence rather than negative consistency, after controlling for other variables ($-0.56, p < .1$). This result differs from prior findings among black adolescents, but we use a more nuanced measure of ambivalence than other studies. As expected, Hispanics are more likely to have positive ambivalence ($0.82, p < .01$).

Contrasting positive ambivalence with negative consistency, age is strongly and positively associated with positive ambivalence ($0.13, p < .001$), which is unexpected but perhaps reflects greater personal and relational resources to handle an unexpected pregnancy. In the same model, however, education is negatively associated with the likelihood of positive ambivalence as expected. Current employment/enrollment status is not significant. The personal belief measure is strongly associated with having positive ambivalence relative to negative consistency, with those believing every pregnancy is a blessing strongly more likely to report positive ambivalence. In particular, the effect size ($1.67, p < .001$) is as big as that of female ($-1.41, p < .001$) in absolute value. This suggests that a generally favorable attitude toward children produces conflicting feelings toward pregnancy among those who would otherwise like to avoid a pregnancy. Personal experiences, such as being in sexual relationship, having children, and having sex education, are not significantly associated with positive ambivalence.

<Table 3 about here>

The number of respondents reporting negative ambivalence is relatively small ($n=37$). Women ($-1.44, p < .01$) are less likely to report negative ambivalence here as well. Being in a sexual relationship ($-1.55, p < .01$) shows a strong negative association with negative

ambivalence, suggesting that negative ambivalence is partly explained by not having a regular partner. However, the other covariates are insignificant when comparing negative ambivalence with negative consistency.

Multivariate Results: Ambivalence and Protection Status

To examine whether ambivalence is associated with consistent use of contraceptives, we turn to logistic regression models. Table 4 displays the results of consistent use of contraceptives on four ambivalence categories for females and males respectively. Consistent use of contraceptives indicates that young adults who are unmarried and sexually active in the past 12 months were well protected from pregnancy. In this analysis, “unprotected” covers young adults who use contraceptives inconsistently, never use it, or are unknown about contraceptive behaviors. Again, negative consistency is the reference group.

The model for women suggests that the likelihood of consistent use of contraceptives varies across ambivalence categories. As expected, positive consistency shows a marginally negative association with consistent use of contraceptives (-1.22 ; $p < .1$), indicating young adults with positively consistent attitude toward pregnancy are less likely to use contraceptives consistently compared to those with negatively consistent attitude. Interestingly, positive ambivalence is not statistically significant, suggesting that it does not differ from negatively consistent group in consistent use of contraceptives. This result diverges from other studies linking ambivalence to contraceptive inconsistency, though those studies use a less refined measure of ambivalence. In contrast, negative ambivalence is significantly and negatively associated with the consistent use of contraceptives, compared to negative consistency (-3.58 , $p < .001$). We expected those having positively consistent attitude toward pregnancy would be the

least likely to be well protected, but the results suggest having negative ambivalence is more problematic for contraceptive use.

When it comes to race-ethnicity, non-Hispanic black (-.78, $p < .05$) and Hispanic (-1.23, $p < .01$) women are significantly less likely to consistently use contraceptives than non-Hispanic whites. However, the effect sizes for racial-ethnic difference in consistent use of contraceptives are similar to or even smaller than those for the ambivalence categories on pregnancy. Age also significantly predicted women's protection status (.09, $p < .1$), indicating that women tend to use contraceptives more consistently as they age. Women in a sexual relationship are significantly more likely to consistently use contraceptives, as would be expected given their higher risk of exposure to sexual activity and thus pregnancy. Finally, sex education significantly predicts consistent use of contraceptives, although it was unrelated to ambivalence.

In contrast with the model for women, there is no significant ambivalence category in the model for men, although all three categories show positive coefficients compared to negative consistency. This demonstrates substantial difference between women and men in the association between attitudes toward pregnancy and contraceptive use. In the model for men, currently being in a sexual relationship has the strongest effect on consistent use of contraceptives (1.14, $p < .001$), indicating that union status is more important than the ambivalence categories in predicting men's consistent contraceptive use. In this model, Asian and other race has a negative association with consistent use of contraceptives (-.93, $p < .05$). Compared to high school graduates, having some college has a marginally positive association with consistent use of contraceptive (.62, $p < .1$). In the same model, sex education shows a significantly positive association towards consistent use of contraceptives, as in the model for women.

<Table 4 about here>

To summarize, several things are of note. First, controlling for all variables in the model for women, individuals with positive ambivalence do not differ from those with negative consistency in consistent use of contraceptives, in contrast with prior work (McQuillan et al. 2010; Santelli et al. 2003; Zabin et al. 1993; Zabin 1999). Second, although rare, negative ambivalence consistently shows a strongly negative impact on women's contraceptive protection status. Third, along with attitude towards pregnancy, race-ethnicity remains an important predictor of contraceptive use among women, with Hispanics and Asians/others displaying distinct patterns in contraceptive use even after controlling for other variables. Fourth, men's contraceptive use is not explained by attitude towards pregnancy. Instead, relational context is more influential. Fifth, sex education demonstrates a significant positive association with contraceptive use for both men and women. Lastly, for women, the magnitude of the ambivalence categories in predicting contraceptive use are larger than those for other variables, suggesting that both cognitive and emotional attitudes toward pregnancy affect women's contraceptive decision-making.

In short, the results of our study suggest that inconsistency in attitudes towards pregnancy is an important factor to account for inconsistent use or nonuse of contraception among women. While women with positive ambivalence do not differ in consistency of contraceptive use from those with consistent attitudes, women with negative ambivalence are less likely to be consistently protected from pregnancy, suggesting higher risk of unintended births. Compared to negative consistency, positive consistency has a negative impact on consistent use of contraceptives. Thus, women's attitudes toward pregnancy are complex and complicated, and the interaction of these attitudes is not associated with reproductive behaviors in a consistent manner.

DISCUSSION

Despite a body of literature on ambivalence toward pregnancy, few studies have considered the notion of ambivalence as incongruence: people who think it is important to avoid getting pregnant, but predict they would be happy with pregnancy and vice versa. This study suggests that ambivalence towards pregnancy is a nuanced concept, with the directions of ambivalence functioning as important predictors of women's consistent use of contraceptives. With a recent survey of unmarried young adults, we explore what features are associated with those ambivalent attitudes toward pregnancy and examine whether those attitudes are related to recent contraceptive behaviors.

The results of our study suggest having ambivalence toward pregnancy is associated with diverse characteristics such as race-ethnicity, education, age, and gender. Hispanics are more likely, and non-Hispanic black young adults less likely, than non-Hispanic whites to report positive ambivalence. In general, women are less likely to report ambivalence on pregnancy, possibly because they will be more affected by a pregnancy and thus have given the matter more thought. Based on previous studies (e.g., Sheeder et al. 2010) about cognitive development, we had expected that ambivalence would decrease with age. In our results, however, when we use two different types of ambivalence, the hypothesis is not valid. Rather, positive ambivalence increases with age and decreases with education. Given the sample of unmarried young adults, one might expect that ambivalence decreases with cognitive development, but increases as age approaches normative ages for childbearing. Increasing positive ambivalence with age might also reflect both a growing recognition of the logistical difficulties inherent in having and raising a child outside of marriage (as the sample included only unmarried young adults) and a set of emotional and social issues that make childbearing more appealing (social pressures to have children, more maturity, more committed intimate unions).

Multivariate analyses of consistent contraception on ambivalence demonstrate that the incongruent types of ambivalences on pregnancy are more influential in predicting the pattern of contraceptive use among women than other covariates. Among unmarried young adults who were sexually active in the past 12 months, women with negative ambivalence (low importance of avoiding pregnancy but dissatisfaction with hypothetical pregnancy) are least likely to use contraceptives consistently. This suggests that women who do not feel as if a pregnancy would be a large burden for them, even if they would not particularly be happy to be pregnant, do not undertake steps to avoid pregnancy in any consistent manner. In contrast, women with positive ambivalence, which is higher importance of avoiding pregnancy and satisfaction with hypothetical pregnancy, are not different from the majority of young women who want to avoid pregnancy in consistent contraceptive use, once we account for socioeconomic characteristics, attitudinal factors, and sources of information. Overall, then, it would seem that among those with ambivalence toward pregnancy, the cognitive dimension seems to outweigh the affective dimension in terms of contraceptive use.

However, attitudes toward pregnancy, particularly ambivalent attitudes, do not seem to be associated with men's contraceptive use. There are several possible explanations. As suggested by our analysis, men appear to be less likely to be concerned about contraception and pregnancy; perhaps because the burdens of an unplanned pregnancy are more immediate for women, and women have been socialized to understand this, women simply might give more thought to pregnancy risk and fertility timing. Thus, men's contraceptive use may be driven by their female partner's desires rather than their own attitudes. In addition, most modern contraceptives except for condoms are female-oriented methods. Men may not know about partner's contraceptive use if they are reluctant to discuss contraception with their partners (Fennell 2011). Furthermore,

female-oriented methods are largely coitus-independent (e.g., hormonal contraceptives, IUDs), while condoms are coitus-dependent. As such, men's contraceptive use may be more sensitive to current relationship status than to broader attitudes.

Despite the non-significant results for men, the results of our study are useful to understand the contraceptive behaviors of unmarried young women. The two ambivalence categories we used provide a clear distinction regarding the association with women's use of contraceptives. The result suggests that as far as contraceptive use, positive ambivalence is not problematic. Rather, given the higher risk of 'unwanted' pregnancy, negative ambivalence is problematic. Individuals with negative ambivalence should be one of the main targets for prevention programs and related policies.

Limitations

This study has several limitations. First, the measure for ambivalence we used here is not a complete one. While we considered both direction and incongruity of ambivalence, we could not account for the strength of feelings. Further, due to the cross-sectional nature of our data, we were unable to determine causality. In addition, because of the limited number of respondents with negative ambivalence, it was difficult to analyze the characteristics of this group in detail. Finally, we want to reiterate that our results are only generalizable to unmarried young adults; it is unclear how attitudes toward pregnancy might be ambiguous or inconsistent among married couples.

Conclusion

This study provides clear evidence that ambivalence toward pregnancy is a multifaceted concept. We demonstrate that only one particular type of ambivalence is negatively associated with consistent contraceptive use. The categories for ambivalence we used here measured

different aspects from those used in previous work, and we thus found different results in analyses predicting contraceptive use, demonstrating the usefulness of a more nuanced measure. Our nuanced measure of pregnancy attitudes may also be useful to explain the association between ambivalence and actual fertility outcomes. For example, individuals with positive ambivalence may decide to give a birth once they get pregnant, regardless of their fertility intention at the time of pregnancy, resulting in 'mistimed' pregnancy. Conversely, negative ambivalence might increase the risk of terminating the pregnancy. Future studies should assess the association between diverse types of ambivalence and pregnancy outcomes.

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Table 1: Four Categories of Ambivalence by Motivation and Feeling about Pregnancy

		“How do you feel if became pregnant now”	
		Upset	Pleased
“How important to avoid pregnancy”	Important	Negative Consistency Most likely to be protected (1 st)	Positive ambivalence More likely to be protected (2 nd)
	Not important	Negative Ambivalence Less likely to be protected (3 rd)	Positive Consistency Least likely to be protected (4 th)

Table 2: Frequency Table for Major Variables by Ambivalence Measure

	Negative Consisten cy	Positive ambivalen ce	Negative Ambivale nce	Positive Consisten cy	Total % (N)
Sociodemographic Variables					
Race-ethnicity ***					
Non-Hispanic white	63.1	26.1	2.3	8.5	60.1 (576)
Non-Hispanic Black	63.7	22.4	4.8	9.1	16.3 (233)
Hispanic	34.8	51.0	2.7	11.5	17.6 (265)
Asian & others	60.7	33.1	2.8	3.5	5.9 (73)
Age (mean years)	22.5 yrs	23.1 yrs	21.6 yrs	23.4 yrs	22.8 yrs
Gender ***					
Male	46.8	40.5	3.7	9.0	53.2 (571)
Female	70.8	18.7	1.8	8.7	46.8 (576)
Education ***					
No high school degree	42.1	46.5	4.8	6.6	16.3 (154)
High school degree	50.4	35.8	3.6	10.2	29.4 (327)
Some college/AA	61.8	28.2	1.7	8.3	34.4 (480)
Bachelor's degree or higher	76.0	12.5	1.9	9.6	19.8 (186)
Current occupation **					
working, not in school	50.9	34.6	1.8	12.6	46.9 (492)
Currently in school	67.4	25.3	3.3	4.0	39.8 (506)
Neither working nor in school	55.3	30.3	4.6	9.9	13.3 (149)
Personal Belief					
Every pregnancy is a blessing ***					
No	79.6	12.4	2.5	5.5	23.1 (234)
Yes	51.6	35.7	2.9	9.8	76.9 (913)
Personal Experience					
Currently in sexual relationship*					
No	54.8	33.1	5.4	6.7	30.3 (363)
Yes	59.5	29.1	1.6	9.8	69.7 (784)
Has children					
No	60.1	29.1	2.6	8.2	75.6 (886)
Yes	51.7	34.2	3.3	10.8	24.4 (261)
Ever had sex education					
No	52.4	35.4	4.5	7.7	20.2 (226)
Yes	59.5	29.0	2.4	9.1	79.8 (921)
Unweighted N	677	341	37	92	1,147
Total %	58.1	30.3	2.8	8.8	100.0

Note: Unweighted N and weighted percentage; Rao-Scott Chi-Square; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3: Multinomial Logistic Regression Result of Ambivalence (ref: Negative Consistency)

Variable	Positive Ambivalence Vs. Negative Consistency			Negative Ambivalence Vs. Negative Consistency			Positive Consistency Vs. Negative Consistency		
	b	SE		b	SE		b	SE	
	Female	-1.41	0.23	***	-1.44	0.51	**	-0.60	0.36
Race-ethnicity: omitted=non-Hispanic White									
Asian/other race	0.56	0.34		0.60	1.25		-0.64	0.78	
Black	-0.56	0.33	†	0.21	0.70		-0.30	0.50	
Hispanic	0.82	0.26	**	0.19	0.88		0.83	0.43	†
Sociodemographic variables									
Age (years)	0.13	0.04	***	-0.05	0.12		0.02	0.07	
Education: omitted=high school degree									
No high school degree	0.75	0.31	*	0.38	0.73		0.11	0.53	
Some college/AA	-0.15	0.27		-0.99	0.70		0.25	0.51	
Bachelor's degree or higher	-1.49	0.39	***	-0.71	0.94		-0.20	0.74	
Current occupation: omitted=working, not in school									
Currently in school	-0.38	0.26		0.26	0.66		-1.47	0.49	**
Neither working nor in school	-0.18	0.36		0.44	0.69		-0.42	0.57	
Personal Belief									
Every pregnancy is a blessing	1.67	0.30	***	0.57	0.52		0.98	0.43	*
Personal Experience									
Currently in sexual relationship	-0.07	0.22		-1.55	0.47	**	0.21	0.38	
Has children	-0.07	0.31		0.78	0.64		0.13	0.60	
Ever had sex education	0.05	0.26		-0.66	0.60		0.16	0.36	
Intercept	-4.02	0.99	***	-0.44	3.06		-2.73	1.53	†
-2LL		1078.98			226.90			562.97	
N		1,018			714			769	

Note: weighted to account for complex sample design; † $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4: Logistic Regression Result of Protection Status on Ambivalence (Consistent Use=1)

Variable	Females			Males		
	b	SE		b	SE	
Ambivalence: omitted= Negative Consistency (important/upset)						
Positive Consistency (not important/pleased)	-1.22	0.69	†	-0.55	0.59	
Positive ambivalence (important/pleased)	0.18	0.35		0.10	0.30	
Negative Ambivalence (not important/upset)	-3.58	0.86	***	0.31	0.66	
Race-ethnicity: omitted=non-Hispanic White						
Asian/other race	-0.63	0.53		-0.93	0.44	*
Black	-0.78	0.39	*	0.11	0.36	
Hispanic	-1.23	0.41	**	-0.03	0.34	
Sociodemographic variables						
Age (years)	0.09	0.05	†	0.01	0.05	
Education: omitted=high school degree						
No high school degree	-0.53	0.48		-0.64	0.42	
Some college/AA	-0.47	0.39		0.62	0.33	†
Bachelor's degree or higher	-0.14	0.48		0.29	0.45	
Current occupation: omitted=working, not in school						
Currently in school	0.25	0.32		0.04	0.30	
Neither working nor in school	0.16	0.47		-0.37	0.51	
Personal Belief						
Every pregnancy is a blessing	0.33	0.36		0.07	0.30	
Personal Experience						
Currently in sexual relationship	0.54	0.33	†	1.15	0.29	***
Has children	0.50	0.32		-0.45	0.41	
Ever had sex education	0.72	0.40	†	0.71	0.32	*
Intercept	-3.46	1.32	**	-1.59	1.19	
-2LL		666.85			792.81	
N		576			571	

Note: weighted to account for complex sample design; † $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.