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Contraceptive Use Patterns Within Females' First Sexual Relationships: The Role of Relationships, Partners, and Methods

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Abstract

This study used the 1995 National Survey of Family Growth (NSFG) to assess whether characteristics of females' sexual partners, relationships, and choice of contraceptive methods were associated with contraceptive use patterns within their first sexual relationship. White, Black, and Hispanic females under age 25 (N = 915) provided retrospective information on sexual activity and contraceptive use for first sexual relationships that occurred between 1991 and 1995. Females with older sexual partners and with same race/ethnicity partners (among Hispanics) had reduced odds of ever using contraception and/or uninterrupted use. Longer sexual relationships were associated with higher odds of ever using contraception but lower odds of uninterrupted use. Females who were older at first sex, who used hormonal methods (among Whites), or who switched to more effective methods during their first sexual relationships had higher odds of ever using contraception and/or uninterrupted use. In contrast, switching to less effective methods during a first sexual relationship was associated with reduced odds of uninterrupted use.

The prevalence of teenage pregnancy and childbearing is high in the United States, especially in comparison with other industrialized countries (Abma, Martinez, Mosher, & Dawson, 2004; Alan Guttmacher Institute, 2004; Martin, Hamilton, & Sutton, 2005; Singh, Darroch, & Frost, 2001; UNICEF, 2001). Public concern and prevention efforts over unintended pregnancies have focused primarily on teens because the vast majority of teen pregnancies and births are unintended (Abma et al., 2004; Henshaw, 1998), few births to teenage mothers occur within marriage (Franzetta, Ikramullah, Manlove, Moore, & Cottingham, 2006), and teenage mothers and their children have poorer economic, cognitive, and behavioral outcomes than do women who delay childbearing (Maynard, 1997; Terry-Humen, Manlove, & Moore, 2005). Racial and ethnic minorities are at an especially high risk of unintended pregnancy and childbearing during the teen years. For example, Black and Hispanic females aged 15–19 have birth rates that are two to three times the rates of non-Hispanic White teen females, with the highest birth rates occurring to Hispanics, followed by Black and White teens (Franzetta et al., 2006; Martin et al., 2005). The especially high rates of adolescent childbearing among racial and ethnic minorities contribute to higher rates of poverty in these communities (National Campaign to Prevent Teen Pregnancy, 2002, 2004).

The prevalence of unintended pregnancy and childbearing also is high among females in their early 20s. In fact, the highest rates of nonmarital childbearing occur to women aged 20–24 (Martin et al., 2005). Nonmarital pregnancy and childbearing in the early 20s is also high among racial and ethnic minorities (Martin et al., 2005), and young women who have a first birth outside of marriage are less likely to marry and are more likely to receive public assistance than are young women who delay childbearing until marriage (Driscoll et al., 1999; Lichter & Graefe, 2001; Martin et al.; Upchurch, Lillard, & Panis, 2001).

Unintended and nonmarital pregnancies can be avoided either through abstaining from sexual intercourse or by using contraception effectively and consistently. However, teens and young adults are typically not consistent users of contraception, including condoms, hormonal methods, and other methods (Abma, Chandra, Mosher, Peterson, & Piccinino, 1997; Abma et al., 2004). Providing a better understanding of factors associated with contraceptive use and consistency among females, including among racial and ethnic subpopulations, potentially could further reduce unintended teen pregnancy in the United States.

Contraceptive consistency is a more accurate predictor of unintended pregnancy than are single-time measures of contraceptive use at first sex or last sex (Glei, 1999). However, although extensive research has addressed factors associated with the timing of first sexual intercourse and contraceptive use at first sex (Kirby, 2001; B. Miller, 2002), relatively little research has assessed factors associated with contraceptive use and consistency over time and within first sexual relationships. Because contraceptive use decisions are made between both partners in a sexual relationship, it is also important to consider how characteristics of sexual relationships and partners may influence contraceptive use patterns. However, previous research has highlighted family, peer, and even community influences on contraceptive decisions, often without considering sexual relationships (Giordano, 2003; Kirby, 2001). In addition, despite a strong focus on relationship type in condom use literature (Noar, Zimmerman, & Atwood, 2004; Sheeran, Abraham, & Orbell, 1999), there has been limited research on the association between a broad range of characteristics of sexual relationships and partners and their association with contraceptive use and consistency.

This article expands upon previous research to examine the association between relationship and partner characteristics and contraceptive use and consistency within a nationally representative sample of females involved in first sexual relationships. We analyze retrospective month-by-month event history data on sexual experiences and contraceptive use patterns among females under age 25 from the 1995 National Survey of Family Growth (NSFG). Because of data availability, the focus of this article is on contraceptive use broadly defined for pregnancy prevention rather than condom use for disease prevention. We focus on first sexual relationships (most of which occur during the teen years) because decision making in early sexual relationships can influence subsequent contraceptive use and the risk of unintended pregnancy (Manlove, Ryan, & Franzetta, 2004, 2005). Using a life-course approach, we address the following research questions: (a) Are characteristics of females' first sexual partners and relationships associated with contraceptive use patterns? (b) Are contraceptive method type and method-switching within a first sexual relationship associated

with contraceptive use and consistency? and (c) Are there racial and ethnic differences in factors associated with contraceptive use in females' first sexual relationships?

Framework

We incorporate a life-course framework (Elder, 1998) in order to assess factors associated with contraceptive use patterns within females' first sexual relationships. A life-course perspective expands upon a life-span development approach in psychology by incorporating a unique focus on time and temporal ordering of life events (Bengtson, Acock, Allen, Dilworth-Anderson, & Klein, 2005; Bengtson & Allen, 1993). Critical life-course concepts of *timing* and *duration* of life events, as well as life-course *transitions*, can be applied to the study of adolescent sexual relationships (Elder, 1998). Specifically, the *timing* of a first sexual experience (or age at first sex) and the *duration* (or length) of a first sexual relationship may have implications for contraceptive use and consistency. We also posit that the *transition* from one contraceptive method to another (e.g., switching from the use of condoms to the use of a hormonal method within the time frame of a sexual relationship) will be associated with contraceptive use outcomes. Another primary life-course principle is that individual behaviors are shaped by the contexts and relationships within which a person is nested (Bengtson & Allen, 1993; Elder, 1998). Thus, we hypothesize that contraceptive use outcomes will be influenced by characteristics of females' first sexual partners and relationships as well as by family environments.

Relationship and Partner Influences on Contraceptive Use

An emerging research literature has assessed contraceptive use within sexual relationships and has provided preliminary evidence that characteristics of partners and relationships are associated with contraceptive use, including condom use, at first sex among females (Abma et al., 2004; Manning, Longmore, & Giordano, 2000; Stone & Ingham, 2002) and with contraceptive or condom use patterns over time and within sexual relationships (Ford, Sohn, & Lepkowski, 2001; Glei, 1999; Manlove, Ryan, & Franzetta, 2003, 2004; Noar et al., 2004; Sheeran et al., 1999). We specifically highlight the potential influence of partner characteristics, self-reported relationship type, age at first sex, length of sexual relationship, and relationship exclusivity on contraceptive use and consistency (Giordano, Manning, & Longmore, 2006). Because the majority of first sexual relationships occur during the teen years, our literature review focuses on studies among teen populations.

One distinct characteristic of adolescent romantic relationships is the presence of *asymmetries* between teens and their sexual partners (Giordano et al., 2006) or differences in socio-demographic characteristics such as age, education, or gender. The most frequently studied relationship asymmetry is age differences between sexual partners. Researchers have found that female teens with older sexual partners are less likely to use contraception (Abma et al., 2004; DiClemente et al., 2002; Ford et al., 2001; Glei, 1999; Manlove et al., 2003; K. S. Miller, Clark, & Moore, 1997). In addition, although partner race/ethnicity difference was not associated with contraceptive use in one study (Ford et al., 2001), another study found that a composite index measuring differences in age and race/ethnicity between partners and whether sexual partners met each other outside of their usual social networks *was* associated

with reduced contraceptive consistency across sexual relationships (Manlove et al., 2005). Researchers suggest that sociodemographic asymmetries may be associated with reduced familiarity between partners, which may lead to reduced discussion about and use of contraception (Ford et al.).

Self-perceived relationship type represents another dimension of sexual relationships that is associated with contraceptive use and consistency. In general, studies have found that females who are going steady with their partners are more likely than are females in more casual relationships to use a contraceptive method at first sex (Abma, Driscoll, & Moore, 1998; Manning et al., 2000; Stone & Ingham, 2002). In addition, females with recent, nonvoluntary, or coercive sexual experiences report reduced contraceptive use (Glei, 1999). In contrast, an extensive literature on predictors of condom use patterns finds lower condom use and consistency in more romantic relationships (Ellen, Cahn, Eyre, & Boyer, 1996; Katz, Fortenberry, Zimet, Blythe, & Orr, 2000; Ku, Sonenstein, & Pleck, 1994; Sheeran et al., 1999). However, this finding may reflect a greater likelihood of the use of a longer term contraceptive method in more serious relationships as couples switch from condoms to birth control pills (Ku et al., 1994).

Age at first sex and the duration of a first sexual relationship are also important predictors of contraceptive use. The younger females are at first sex, the less likely they are to use a contraceptive method (Glei, 1999; Manning et al., 2000). In addition, as the duration of sexual relationships lengthens, female and male teens are more likely to ever use contraception but are also less likely to use contraception consistently (Ford et al., 2001; Manlove et al., 2003). Condom use also declines across the duration of sexual relationships (Katz et al., 2000; Ku et al., 1994).

Last, issues of exclusivity and commitment are also prominent in adolescent romantic relationships (Giordano et al., 2006), and teens in nonmonogamous (or concurrent) sexual relationships may be more willing to take sexual risks and thus are less likely to use contraception consistently. Limited research has been conducted on the influence of nonmono-gamous relationships on contraceptive use, with one study showing no association between concurrent sexual relationships and contraceptive use (Manlove et al., 2005) and another study finding that teens in concurrent or nonmonogamous relationships reported lower condom use and lower self-efficacy to use contraceptives compared with teens in single or sequential relationships (Kelley, Borawski, Flocke, & Keen, 2003). However, among those in concurrent relationships, more frequent condom use is reported when having sex with someone other than the “main partner” (Santelli et al., 1996).

Method Choice and Contraceptive Use Patterns

The type of contraceptive method that females use during their sexual relationships may be associated with contraceptive use patterns. On average, teens who use birth control pills are more likely than those who use coitus-dependent methods, such as condoms, to use contraception consistently (Abma et al., 1997). However, research has provided mixed evidence about the links between method choice and consistency, with one study showing a positive association between hormonal methods and contraceptive consistency among

females (Manlove et al., 2004) and another study finding no link between method type and contraceptive consistency in male and female teens' first sexual relationships (Manlove et al., 2003). As females become more "serious" with their sexual partners, they might choose to transition from a coitus-dependent method, such as a condom, to a longer term method, such as oral contraceptives or injectables (Brindis, Pagliaro, & Davis, 2000). One potential side effect of switching methods within sexual relationships is that partners might go for periods of time without effective contraceptive coverage. Zabin (1999) has suggested that as couples switch from condoms to hormonal methods, they might stop condom use before their longer term methods are effective, leading to what she called the "condom gap."

Family and Individual Controls

Family factors associated with greater contraceptive use and consistency include living in a household with two biological parents and having parents with higher educational levels (Manlove et al., 2003; Manning et al., 2000). Findings linking parent-teen discussions about sexual activity and contraceptive use have been mixed with some studies showing a positive association and others showing no association or even a negative association (Clawson & Reese-Weber, 2003; Dilorio, Pluhar, & Blecher, 2003; B. Miller, Benson, & Galbraith, 2001).

Several individual factors are associated with contraceptive use and consistency. Whereas having higher grades or test scores is associated with increased contraceptive use and consistency (Afxentiou & Hawley, 1997; Manlove et al., 2003; Manning et al., 2000), members of racial and ethnic minorities, especially Hispanics, are less likely to use contraception and more likely to experience an unintended pregnancy and a teen birth than non-Hispanic Whites (Ford et al., 2001; Henshaw, 1998; Manlove et al., 2003; Manning et al., 2000). Religiosity, including religious attendance, also is associated with contraceptive use in some studies. Although higher levels of religious attendance and beliefs are associated with delayed sexual initiation (Billy, Brewster, & Grady, 1994; Jones, Darroch, & Singh, 2005; B. Miller et al., 1997; Mott, Fondell, Hu, Kowaleski-Jones, & Menaghan, 1996; Murry, 1994; Resnick et al., 1997), some studies suggest that when more religious teens do become sexually active they are sometimes less likely to use contraception than are their less religious peers (Manlove, Terry-Humen, Ikramullah, & Moore, 2006; Rostosky, Wilcox, Wright, & Randall, 2004; Studer & Thornton, 1987). Formal sex education also has been associated with contraceptive use, although findings about the effectiveness of specific pregnancy prevention programs have been mixed (Kirby, 2001). One study found that receiving sex education was associated with a greater likelihood of contraceptive use at first sex among females (Manning et al., 2000), whereas another study found no association between sex education and contraceptive use within first sexual relationships among males and females (Manlove et al., 2003).

Hypotheses

As suggested by the literature review, contraceptive decisions are shaped by multiple influences, including family, individual, relationship, and partner characteristics. Thus, analyses of contraceptive use patterns require a nationally representative data file with

detailed information on sexual partners, sexual activity, contraceptive method, and method switching. The NSFG (1995 cycle) is the only nationally representative data file available to answer all of the research questions posed in this article. The 1995 NSFG provides detailed month-by-month event history reports on sexual activity, relationship and partner characteristics, contraceptive use patterns, and method switching. This retrospective information includes complete contraceptive histories within females' first sexual relationships. Note that the recently released 2002 NSFG does not provide this level of detailed event history information (Abma et al., 2004). The 1995 NSFG data also include large enough samples of Hispanics and non-Hispanic Black women to test interactions between race/ethnicity and correlates of contraceptive use patterns.

We hypothesize that multiple factors will influence contraceptive use patterns during females' first sexual relationships, including (a) characteristics of the first sexual partner and relationship and (b) contraceptive method choice, dual method use, and method switching. Further, we hypothesize that (c) the associations between relationship and partner characteristics and contraceptive use patterns will differ by race and ethnicity. Specifically, we expect that partner asymmetries, nonmonogamous and unwanted sexual relationships, and sexual relationships beginning at younger ages will be associated with reduced contraceptive use and consistency. We anticipate that longer sexual relationships will be associated with greater contraceptive use but reduced consistency. Finally, we hypothesize that hormonal method use will be associated with greater odds of uninterrupted contraceptive use, whereas switching methods will be associated with reduced odds.

Our study expands upon previous research in several ways. First, we measure contraceptive use patterns across teen and young adult females' first sexual relationships instead of focusing on use at a single point in time, such as at first sex. Second, we provide detailed information on the types of partners females choose in their first sexual relationships, the characteristics of their relationships, and how these characteristics are associated with contraceptive use patterns. Minimal research has examined the association between sexual partners and relationships and contraceptive use (Giordano, 2003); those studies that have examined sexual relationships have often relied on single indicators, such as relationship type, or have used nonrepresentative samples. Third, we examine how choice of contraceptive method, dual method use, and method switching within the first sexual relationship are associated with contraceptive use patterns, expanding on the very limited available research on this topic. Finally, we examine how the links between contraceptive patterns and relationship, partner, and other factors differ by race and ethnicity.

Method

Data and Sample

This study analyzed data from the 1995 NSFG. The NSFG is a nationally representative survey of women aged 15–44. The NSFG data, collected by the National Center for Health Statistics (NCHS), were designed to provide estimates of factors affecting the reproductive health of U.S. women of childbearing age (Abma et al., 1997). A total of 10,847 interviews were completed in 1995, and Hispanic women were oversampled.

The analytic sample was restricted to females under age 25 who reported their date of first voluntary sexual intercourse between January 1991 and the date of interview (1,030). We reported on first voluntary sexual relationships because respondents did not provide information on nonvoluntary relationships. Because married respondents likely had different motivations for avoiding pregnancy and different contraceptive practices than did unmarried females, respondents who were married to their first partner at first sex or eventually married their first sexual partner were excluded (94; Chandra, Martinez, Mosher, Abma, & Jones, 2005). We also excluded respondents for whom information on their first sexual partner was missing (4) and those with inconsistencies in the dates of first sex, last sex, and periods of abstinence (17). The 115 females excluded from the sample were more likely to be Hispanic, live with both biological or adoptive parents, have higher grades and church attendance, an earlier age at first sex, and lower parental educational attainment than our final sample. The final sample consisted of 915 women aged 15–24 in 1995 with a recent first sexual relationship (age at first sex: $M = 16.4$, $SD = 2.1$; range = 11–24). Of these, 92% were under age 20 at first sex. By excluding females who did not have first sex between January 1991 and 1995 from our sample, our resulting sample differed systematically from a full sample of females. Females who were excluded from our sample because they did not have first sex between January 1991 and 1995 were more likely to live with two biological or adoptive parents and have higher grades than females in our final sample. We tested for potential sample selection effects using Heckman selection models in Stata; however, the rho values for the selection equations were not significant in any models. As a result, we feel confident in using models that do not adjust for selection.

Measures

The NSFG survey included retrospective event history data reported to the interviewer in a calendar format. For each month between January 1991 and the date of interview in 1995, respondents reported whether they had had sexual intercourse at any time during that month and whether they used any contraceptive method during each month of sexual activity. If a method was used, respondents were asked to provide the type(s) used during each month (up to four different methods were allowed).

Contraceptive use outcomes.—We used this calendar information to create two measures of contraceptive use within females' first sexual relationships. The first dependent variable measured use of contraception in any month of the first sexual relationship (ever use) against no contraceptive use in the first sexual relationship. Because consistent contraceptive use is a goal for pregnancy prevention, the second dependent variable measured use of a method in every month of the first sexual relationship (uninterrupted users) compared with those who used contraception in some but not all months (sporadic users) and those who never used contraception. For those who experienced a pregnancy during their first sexual relationship, we measured contraceptive use only during nonpregnancy months because contraceptive use patterns may be influenced by pregnancy.

Partner characteristics.—Two measures of differences in partner characteristics were included in our analyses. Age difference between the respondent and her first sexual partner

was reported at the time of the respondent's first sex experience. In addition, we measured whether the respondent's first sexual partner was a different race/ethnicity.

Relationship characteristics.—Respondents provided information on several characteristics of their first sexual relationship. All respondents described the type of relationship that they had with their partners at the time of first sexual intercourse (“going steady/engaged” compared with “just met,” “just friends,” or “went out once in a while”). In addition, information was gathered on respondents' age at first sexual intercourse; the degree to which they wanted this sexual relationship to happen, ranging from 1 (*didn't really want it to happen*) to 10 (*really wanted it to happen*); the length of their first sexual relationship (in months); and whether that relationship was nonmonogamous (defined as those in which the beginning and ending dates of sex with a first sexual partner overlapped with those of another sexual partner).

Family and individual controls.—Family characteristics included family structure (whether the respondent grew up with two biological/adoptive parents, compared with any other family structure type) and highest parental educational attainment, ranging from 0 (*no formal education*) to 19 (*7 years or more of postsecondary education*). Individual characteristics included the respondent's race/ethnicity (comparing Hispanic, non-Hispanic Black, and non-Hispanic other teens with non-Hispanic White teens); self-reported average grades received in junior or senior high school, ranging from 1 (Fs) to 9 (As); and church attendance at age 14, ranging from 1 (*more than once a week*) to 4 (*never/less than once a week*). Respondents reported whether they had discussions with parents (before age 18) about how pregnancy occurs and whether they received formal sex education at school, church, a community center, or some other place on three or four of the following topics: birth control, sexually transmitted diseases, how to prevent AIDS by using safe sex practices, or abstinence /how to say no to sex before their first sexual experience.

Contraceptive methods.—Among respondents who reported ever using a method during their first sexual relationship, we measured the most effective type of contraceptive method used, comparing hormonal method users (birth control pills; IUD, coil, loop; Norplant, Depo-Provera, or injectables), condom users, and those who used other methods (diaphragm, foam, jelly or cream, Today® sponge, rhythm, natural family planning, or withdrawal), and whether dual methods were ever used in any month. We created two additional measures of contraceptive use for respondents who used a method at least 2 months during their first relationship. The first variable measured whether the respondent switched methods between the earliest method used and the last method used. The second variable measured whether respondents switched to a more effective method or a less effective method on the basis of effectiveness ratings for pregnancy prevention (Hatcher et al., 1998) or did not switch methods. Each method received a unique rating so that any change in method type would result in either an increase or a decrease in contraceptive effectiveness. Among those who increased contraceptive effectiveness, 85% switched from using condoms to using a hormonal method and 13% switched from withdrawal to using condoms or a hormonal method (9% and 4% respectively). The remaining 2% who increased effectiveness switched from using birth control pills to using Depo-Provera.

Among those who decreased the effectiveness of contraceptive use, 50% switched from using condoms to withdrawal, Today sponge, jelly or cream, foam, or calendar/rhythm method; 34% switched from using birth control pills to using condoms, and 8% switched from birth control pills to calendar/rhythm method, withdrawal, or jelly or cream; and 8% switched from Depo-Provera to birth control pills (7%) or condoms (1%).

Data Analyses

For bivariate analyses, we used general linear models (GLMs), *t* tests and chi-square analyses to test for associations between continuous and categorical variables respectively and our dichotomous dependent variables (Agresti & Finlay, 1997). We compared those who ever used versus those who never used a method and compared uninterrupted users versus sporadic users (who used contraception in some, but not all, months of the first sexual relationship) or nonusers. In order to adjust for Type 1 error, we incorporated Bonferroni adjustments into our bivariate analyses (Tabachnick & Fidell, 1996). In order to confirm the validity of the contraceptive use measures, we assessed the association between contraceptive use patterns and risk of pregnancy by using life table survival analyses. Life table analyses controlled for right censoring, which occurred for the large proportion of women who ended their first sexual relationship or who reached the interview date without having a pregnancy (Allison, 1997).

For multivariate analyses, logistic regressions tested whether partner and relationship characteristics were associated with ever using contraception and uninterrupted contraceptive use, net of family and individual controls. Additional analyses were performed on a subsample of respondents who reported 2 or more months of contraceptive use within their first sexual relationship ($n = 644$) to allow comparisons of how type of contraceptive method and method switching were associated with contraceptive use patterns. The betas in all multivariate models were exponentiated, so that a value greater than one was associated with increased odds of ever using contraception or uninterrupted contraceptive use patterns, and a value less than one was associated with reduced odds. Interaction models tested differences between Whites, Blacks, and Hispanics in the association between partner, relationship, and contraceptive method use and contraceptive use outcomes. All analyses were weighted and adjust for complex sampling design.

Results

Sample Characteristics and Differences by Race/Ethnicity

Table 1 presents means and frequencies for all variables in our analyses for the full sample and by race/ethnicity. Overall, two thirds (69%) of females reported using contraception in every month of their first sexual relationship, 23% used contraception sporadically, and 8% never used contraception. The first sexual partners of women in this sample were, on average, 2 years older and the majority (81%) had a partner who was the same race/ethnicity. On average, women in the sample were between ages 16 and 17 at their first sexual experience. Three quarters (77%) were going steady or were engaged to their partner at the time of their first sexual intercourse, and first sexual relationships lasted for approximately 1

year. Women averaged 6.3 on the wantedness scale, and 1 in 8 began a second sexual relationship at some point during the first sexual relationship.

Several differences were found by race/ethnicity on partner and relationship characteristics and method use within a respondent's first sexual relationship. Less than one half of Hispanic women reported uninterrupted contraceptive use (47%) compared with almost two thirds of Black females (65%) and three quarters (74%) of White females. Black females were more likely to be in nonmonogamous relationships, to be younger at first sex, and to report a lower level of wantedness of their first sexual experience than were White or Hispanic women. Hispanic females were more likely to have had a partner who was a different race/ethnicity than themselves, whereas white females were more likely to use dual methods at some point in their first relationship.

Life Table Results – Validity of Outcomes

Table 2 shows a significant association between contraceptive use patterns and the risk of a pregnancy within first sexual relationships: 89% of women who reported never using a contraceptive method in their first sexual relationship had a nonmarital pregnancy with that partner compared with 33% of sporadic users and 10% of uninterrupted users. These findings confirmed the validity of measuring monthly contra-ceptive use patterns as outcome variables associated with pregnancy risk. Although females who switched methods in their first sexual relationship were no more likely to get pregnant than were those who did not switch methods, analyses showed a greater likelihood of a nonmarital pregnancy among those who switched to a less effective method (41%) than among those who increased effectiveness (20%) or who did not switch methods (17%). Females who used hormonal methods were significantly more likely to become pregnant in their first sexual relationship (23%) than were those whose partners used condoms (10%) as their most effective method.

Bivariate Results

Bivariate analyses showed differences in covariates by whether women ever used contraception in any month of their first sexual relationship and by whether they had uninterrupted contraceptive use within their first sexual relationship. The age difference between women and their first sexual partners was a year larger among those who never (vs. ever) used contraception (Table 3). Females who ever (vs. never) used contraception were, on average, more likely to be going steady with or engaged to their partner at first sex, were older at first sex, had longer first sexual relationships, and were more likely to have nonmonogamous relationships.

Females who had uninterrupted (vs. never or sporadic) contraceptive use had a smaller age difference with their partner as well as shorter first sexual relationships. Among females who used a contraceptive method for at least 2 months, uninterrupted contraceptive users were more likely than others to have switched to using a more effective contraceptive method and were less likely to have switched to a less effective method within their first sexual relationship.

Multivariate Results

Contraceptive use patterns.—The multivariate logistic regression models in Table 4 show that partner and relationship factors were associated with ever using contraception and uninterrupted contraceptive use within females' first sexual relationships. Every year of age difference between females and their first sexual partner was associated with a 12% reduction in the odds of ever using contraception and a 7% reduction in the odds of uninterrupted contraceptive use. Further, each additional year that females delayed having first sex was associated with a 26% increase in the odds of ever using contraception. Although the duration of the first sexual relationship was associated with increased odds of ever (vs. never) using contraception, with 9% higher odds of ever using contraception for every additional month of relationship length, a longer first sexual relationship was associated with reduced odds of uninterrupted use.

After controlling for partner and relationship characteristics, Hispanics had lower odds of ever and uninterrupted contraceptive use than Whites. In contrast, females who discussed with their parents how pregnancy occurs had higher odds of ever using contraception within their first sexual relationship. Higher grades and receiving three or more forms of sex education were associated with increased odds of uninterrupted contraceptive use, whereas more frequent church attendance was associated with lower odds.

Method use and contraceptive use patterns.—In order to examine the influence of method type and method switching on contraceptive use patterns, Table 5 presents odds ratios from two logistic regression models comparing uninterrupted and sporadic contraceptive use patterns among respondents who used contraception in 2 or more months of their first sexual relationships. Both models included the covariates shown in Table 4, with the addition of measures of method use, dual methods, and method switching.

As shown in Table 5, none of the measures pertaining to method effectiveness, dual method use, or method switching were significantly associated with uninterrupted contraceptive use. However, increasing and decreasing method effectiveness, relative to using the same contraceptive method through the first sexual relationship, were associated with the odds of uninterrupted contraceptive use (see Table 5). Females who switched to a more effective method had more than three times the odds of using a method in every month compared with females who did not switch methods within their first sexual relationship. In contrast, respondents who reported switching to a less effective method(e.g., from pill to condom) had 63% lower odds of uninterrupted method use.

Interactions with race and ethnicity.—We tested interactions between race/ethnicity and all partner, relationship, and contraceptive method measures from Tables 4 and 5. Table 6 presents the significant interaction findings. The first odds ratio in each set reports the interaction effect between these measures and Hispanic females (compared with White females), whereas the remaining odds ratios report the main effects of each measure by race/ethnicity. Note that none of the interactions for Black females were significant, indicating that the associations between the predictor variables and the outcome measures did not differ for Blacks and Whites. Thus, main effects for Black females are not reported in Table 6.

We found significant race/ethnicity differences for four variables: age differences between females and their first sexual partners, race/ethnicity differences between females and their first sexual partners, age at first sex, and hormonal method use. Both partner age difference and age at first sex were significant in Table 4; however, the interactions in Table 6 indicate that these two factors were not significant for Hispanics. Having a larger age difference between oneself and one's partner was associated with lower odds of ever using contraception for Whites but not for Hispanics. Also, older age at first sex was associated with greater odds of contraceptive use for Whites but was not important for Hispanics.

Having a partner who was of a different race/ethnicity was not significant in the main effects models (see Table 4); however, the interactions showed that these differences were significant for specific racial/ethnic subgroups. Hispanic females with non-Hispanic partners had greater odds of ever using contraception; however, partner race/ethnicity differences were not significant for Whites. Using a hormonal method was significantly associated with uninterrupted contraceptive use for Whites but not for Hispanics. White females who used a hormonal method had more than twice the odds of uninterrupted contraceptive use within their first sexual relationship compared with those whose partners used condoms. The significant racial/ethnic interactions for partner race/ethnicity and hormonal use indicated that the previous nonsignificant findings in the main effect models had masked important differing effects for Whites and Hispanics.

Discussion

This research incorporated a life-course perspective and extends our understanding of contraceptive use patterns within females' first sexual relationships by showing the influence of relationship and partner characteristics and contraceptive method use and method switching on contraceptive use outcomes. Our findings support the hypothesis that partner asymmetries and relationship characteristics are associated with contraceptive use outcomes. Specifically, we found that having an older sexual partner compromised contraceptive use and uninterrupted use within first sexual relationships, supporting previous research on this topic (Ford et al., 2001; Manlove et al., 2003). This finding, combined with other research linking older partner age with unwanted first sexual experiences, suggests that females with older partners may perceive less power in these relationships and may be less able to negotiate decisions about contraceptive use (Abma et al., 1998; DiClemente et al., 2002; Ford et al., 2000; K. S. Miller et al., 1997). The association between perceived power differences and contraceptive use decisions is supported in a recent study showing that among couples with different contraceptive intentions, the partner with higher levels of perceived emotional intimacy power was more likely to have his or her contraceptive desires met (Tschann, Adler, Millstein, Gurvey, & Ellen, 2002).

As hypothesized, relationship length also was associated with contraceptive outcomes, with longer relationships associated with greater odds of ever using contraception but reduced odds of uninterrupted contraceptive use. This finding confirms other research (Manlove et al., 2003) and highlights the difficulty of maintaining perfect use over time. Despite attention placed on dramatic improvements in teens' use of contraceptives when they first have sex (Centers for Disease Control and Prevention, 2004), our finding that 1 in 3 females use

contraception inconsistently or not at all in their first sexual relationship highlights the importance of helping teens maintain their motivation to use contraception over time.

Females who were younger at first sex had lower odds of ever using contraception and uninterrupted monthly use in their first sexual relationship. Moreover, other research with NSFG data has found that the youngest sexually experienced females are the most likely to have older partners and are also the most likely to have nonvoluntary sexual experiences, which might reduce their ability to negotiate contraceptive use decisions with their partners (Abma et al., 1998; Ryan, Manlove, & Franzetta, 2003). Thus, programs that help teens postpone first sexual experiences can reduce teens' exposure to risk through delayed sex and through increased contraceptive use when they do have sex.

It is surprising that our study found no association between going steady or being engaged at the time of first sex and contraceptive use outcomes. These findings contrast with evidence from another study that found a very strong association between relationship type and the use of any contraceptive method at first sex that was based on analyses of the same data file (Manning et al., 2000). The difference in findings between studies suggests that relationship type may have a significant influence at the start of a sexual relationship but that other individual, partner, and relationship characteristics may be more important predictors of contraceptive use patterns across the relationship.

Contraceptive Method and Method Switching

As hypothesized, we found that females who used hormonal methods also had greater odds of reporting uninterrupted contraceptive use within their first sexual relationship, although this finding was only among White teens. However, females reporting hormonal methods (primarily birth control pills) within their first sexual relationship were more—not less—likely to become pregnant than were females whose partners used condoms. Although hormonal methods are rated as more effective for pregnancy prevention than are condoms, the effectiveness of birth control pills is compromised when pill use is inconsistent (Hatcher et al., 1998). Females who missed taking birth control pills could be classified as uninterrupted users in our analyses (provided they took the pill at least once in a month) and still be at an increased risk of pregnancy. For those females who are sexually active on a regular basis, more recently available hormonal methods, such as injectables and the contraceptive patch, may be the most effective approach to pregnancy prevention. However, recent estimates show that the percentage of young females who use these methods is still fairly low, with 34% of sexually active female teens using birth control pills and only 9% using other hormonal methods such as injectables, implants, or contraceptive patches (Abma et al., 2004).

In contrast to our hypothesis, we did not find that method switching was associated with interrupted contraceptive use patterns within the first relationship (a “condom gap”) or with a greater risk of pregnancy. Instead, we found that females who transitioned to a more effective method (the majority of whom switched from the use of a condom to the use of a hormonal method) had much greater odds of uninterrupted use than those who maintained the same contraceptive method throughout their first sexual relationship. However, we did identify a group of high-risk females who transitioned to using a less effective method by the

end of their relationship. These females were at especially high risk of interrupted contraceptive use and of pregnancy. Because many teens have episodic sexual relationships, they may be less likely than older women to use the same method over time (Kusseling & Wenger, 1995). Thus, we need better information on motivations to switch methods, and we need to recognize that those who are switching methods may be in need of intervention so that they maintain consistent, effective use.

Racial/Ethnic Differences

Hispanic females had lower odds of ever using contraceptives or of uninterrupted contraceptive use compared with White teens, which supports other research (Ford et al., 2001; Ku et al., 1994; Manlove et al., 2003; Manning et al., 2000), and this may contribute to especially high birth rates among Hispanics (Martin et al., 2005). Interactions by race/ethnicity show that partner race/ethnicity was associated with contraceptive use for Hispanic females only. Contrary to our hypothesis, we found that Hispanic females with a different racial/ethnic partner were more likely ever to use contraception. Thus, when both partners were Hispanic, the risk of never using contraception was greater. Our data indicate that Hispanic females were less likely than White and Black females to discuss issues related to reproductive health with their parents, and other research has found that Hispanic teens are less likely to discuss issues related to contraception with their first sexual partners (Ryan et al., 2003). These findings suggest the lower contraceptive use among Hispanics may reflect cultural differences in communication about contraception and contraceptive use decision making, as well as possible differences in access to contraception, that are not captured with these data.

Several of the interactions suggest that some factors were significant for Whites but not for Hispanics, including a younger age at first sex, having an older sexual partner, and using hormonal methods. The lack of interactions between Black and White females indicates that similar factors were associated with contraceptive use patterns between both racial/ethnic groups. Lower levels of uninterrupted contraceptive use among Black females, compared with Whites, thus appear to be due to differences in family, individual, partner, and sexual experiences.

Important Family and Individual Controls

Family and individual characteristics also were associated with contraceptive use patterns. The positive association between discussions with parents and ever using contraception reinforces previous research on the importance of strong parent–teen relationships in protecting against risky sexual behaviors (B. Miller, 1998, 2002). Our analyses indicate that sex education is important not only for use at first sex (Manning et al., 2000) but also for maintaining uninterrupted contraceptive use over time. The finding that higher self-reported grades are associated with uninterrupted contraceptive use helps confirm research showing the importance of educational performance for improving motivations and behaviors to avoid pregnancy (Afxentiou & Hawley, 1997; Manning et al., 2000). Improved educational performance may also increase educational aspirations, which has been linked to greater motivations to prevent pregnancy (Kirby, Lepore, & Ryan, 2005; Manlove, 1998; Rosenbaum & Kandel, 1990). The negative association between church attendance and

uninterrupted contraceptive use provides some confirmation of prior research, showing that although higher religious attendance is associated with a later timing of first sex (Jones et al., 2005; Rostosky et al., 2004), once more religious teens do engage in sexual intercourse they may not use contraception consistently (Manlove et al., 2006; Rostosky et al., 2004; Studer & Thornton, 1987). This finding, along with the positive association between receiving multiple types of sex education and greater odds of uninterrupted contraceptive use, highlights the benefit, within pregnancy prevention programs, of combining messages about abstinence as the best approach for avoiding unintended pregnancy with the importance of using contraception consistently when teens do become sexually active (Kirby, 2001).

Limitations

Our study has limitations, primarily due to data issues. First, contraceptive use patterns were based on retrospective month-by-month event histories, from up to 4 years before the interview date, whereas the ideal would be to have respondents report use in a daily or monthly calendar (Kauth, Lawrence, & Kelly, 1991). Also, the NSFG relies on self-reported data on contraceptive use and pregnancy. Pregnancy, in particular, is often underreported in self-administered surveys (Henshaw, 1998). However, the 1995 NSFG addressed potential response issues by incorporating computer assisted self-interviews that helped teens report the timing of sensitive behaviors, such as sexual activity and contraceptive use, in the context of other life events (Department of Health and Human Services, 1997). Second, because contraceptive use was reported in each month of sexual activity, this format overreports consistent contraceptive use for those teens who used contraception at least once in a month but may not have used contraception every time that they had sex in a particular month. Another potential source of overestimated contraceptive use could occur through interviewer error. In entering survey responses, interviewers were given the option of hitting a duplicate key when teens responded that the contraceptive method they used was “same as last month” or “same until end of the year.” There is evidence that, in some cases, interviewers inadvertently hit the duplicate key too many times, resulting in an overestimate of months of contraceptive use (personal communication, A. Chandra, June, 2003). Nevertheless, 73% of our sample reported at least one period of abstinence during the 1991–1995 time period, which would interrupt this type of error. Moreover, the 69% who reported uninterrupted contraceptive use in this sample is similar to the estimated 63% of teens who reported always using contraception with their first sexual partner in the Add Health data (Manlove et al., 2003). Also, a substantial proportion of teens reported never using contraception and reported interrupted contraceptive use, and the association between contraceptive use patterns and the risk of a nonmarital pregnancy (see Table 2) helped to confirm the validity of the outcome measures. One final limitation is that some control variables, such as adolescent religiosity, were measured with single items in the NSFG.

Conclusion

In conclusion, we incorporated a life-course framework and extended previous research by finding that relationship and partner factors and contraceptive methods were associated with contraceptive use patterns within White, Black, and Hispanic females' first sexual

relationships. Although females who used hormonal methods had greater odds of uninterrupted use, they also faced a greater risk of nonmarital pregnancy compared with those whose partners used condoms. We also identified a group of teens that switched to less effective contraceptive methods and were at a greater risk of contraceptive inconsistency and pregnancy. In order to reduce high rates of teenage pregnancy in the United States, it is important for parents, service providers, policy makers, and teens themselves to help improve teens' motivations to use contraception consistently over time and within sexual relationships.

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Table 1.
Sample Characteristics Among Females' First Sexual Relationships, by Race/Ethnicity (Weighted)

Variable	Range	Total	Non-Hispanic Whites	Non-Hispanic Blacks	Hispanics	χ^2/F
Total		100%	70.5%	16.4%	13.1%	
Contraceptive Use in First Sexual Relationship						$\chi^2(4, 886) = 36.32^{***}$
Never used contraception	(0, 1)	7.8%	6.4%	8.4%	18.9%	
Sporadic contraceptive use	(0, 1)	23.1%	19.7%	26.6%	36.0%	
Uninterrupted contraceptive use	(0, 1)	69.2%	73.9%	65.0%	47.1%	
Partner Characteristics						
Age difference between R and first sexual partner (in years)	(-3, +16)	2.04	1.94	2.01	2.45	$R^2, 174) = 1.00$
First partner is different race/ethnicity	(0, 1)	18.8%	13.7%	12.4%	40.2%	$R^2, 174) = 21.66^{***}$
Relationship Characteristics						
Going steady/engaged at first sex	(0, 1)	77.3%	75.9%	70.9%	81.3%	$R^2, 174) = 1.82$
Age at first sex (in years)	(11-24)	16.38	16.45	15.89	16.30	$R^2, 174) = 4.28^*$
Wantedness of first sexual experience	(1-10)	6.3	6.5	2.0	6.4	$R^2, 174) = 12.98^{***}$
Length of first sexual relationship (in months)	(1-52)	11.9	11.6	12.0	13.1	$R^2, 174) = 1.43$
First relationship was not monogamous	(0, 1)	13.1%	11.4%	21.7%	11.5%	$R^2, 174) = 4.21^*$
Family and Individual Controls						
Lived with two biological/adoptive parents at age 14	(0, 1)	47.4%	52.0%	33.1%	41.3%	$R^2, 174) = 8.02^{***}$
Parents' educational attainment	(0-19)	13.78	14.07	13.55	12.21	$R^2, 174) = 21.80^{***}$
Grades	(1:F's to 9:A's)	6.78	6.92	6.39	6.29	$R^2, 174) = 16.86^{***}$
Church attendance at age 14—one or more times a month	(0, 1)	65.0%	62.2%	79.4%	63.8%	$R^2, 174) = 7.74^{***}$
Discussions with parents on how pregnancy occurs	(0, 1)	67.6%	72.1%	65.4%	51.9%	$R^2, 174) = 8.81^{***}$
Received 3+ forms of sex education before first sex	(0, 1)	66.1%	66.4%	71.1%	64.2%	$R^2, 174) = .82$
Contraceptive Methods Used in First Relationship ^a						
Most effective method used						$\chi^2(4, 620) = 1.76$
Hormonal method	(0, 1)	46.6%	47.1%	52.0%	42.3%	

Variable	Range	Total	Non-Hispanic Whites	Non-Hispanic Blacks	Hispanics	χ^2
Condom	(0, 1)	51.7%	51.5%	46.4%	56.2%	
Other	(0, 1)	1.8%	1.4%	1.7%	1.5%	
Ever used dual methods	(0, 1)	25.7%	28.8%	19.1%	17.3%	$\chi^2(2, 153) = 3.85^*$
Switched methods between first and last method	(0, 1)	25.9%	26.4%	27.8%	22.7%	$\chi^2(2, 153) = .44$
Method switching (first to last)						$\chi^2(4, 620) = .81$
Increased effectiveness	(0, 1)	19.6%	19.8%	21.9%	17.2%	
Decreased effectiveness	(0, 1)	6.3%	6.6%	5.9%	5.5%	
Did not switch methods	(0, 1)	74.1%	73.6%	72.2%	77.3%	
<i>N</i> =		915	552	197	137	

Note. R = respondent.

^a Among respondents who used a method for at least two months (*N* = 644).

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Pregnancies Within Females' First Sexual Relationship, by Contraceptive Use and Method (Weighted)

Table 2.

Variable	Percentage With a Pregnancy	-2 Log Likelihood	df
Contraceptive Use Patterns in First Relationship		34.23 ***	2
Never used contraception	88.5		
Sporadic contraceptive use (ref.)	32.7		
Uninterrupted contraceptive use	9.9		
Switched Methods ^a		2.92	1
Yes	22.7		
No (ref.)	17.3		
Method Switching ^a		13.42 **	1
Increased effectiveness	19.8		
Decreased effectiveness	41.1		
Most Effective Contraceptive Method Used ^a		10.58 **	2
Hormonal method	23.3		
Condom	10.1		
Dual Method Use ^a		2.01	1
Yes	15.1		
No (ref.)	17.2		

^a Among 644 women who reported using a contraceptive method in at least 2 months in their first sexual relationship.* $p < .05$.** $p < .01$.*** $p < .001$.

Table 3.
Partner, Relationship, and Method Use Characteristics Among First Sexual Relationships, by Contraceptive Use Patterns (Weighted)

Variable	Range	Never Used Contraception	Ever Used Contraception	F	Never/Sporadic Contraceptive Use	Uninterrupted Contraceptive Use	F
N		76	839		315	600	
Total		7.8%	92.2%		32.4%	67.6%	
Partner Characteristics							
Age difference between R and first sexual partner (in years)	(-3,+16)	3.0	2.0	$F(1, 178) = 8.40^{**}$	2.3	1.9	$F(1, 178) = 5.48^*$
First partner is different race/ethnicity	(0, 1)	17.9%	18.9%	$F(1, 178) = .04$	19.5%	18.4%	$F(1, 178) = .16$
Relationship Characteristics							
Going steady/engaged at first sex	(0,1)	60.1%	78.7%	$F(1, 178) = 9.11^{**}$	78.1%	76.8%	$F(1, 178) = .23$
Age at first sex (in years)	(11-24)	15.6	16.4	$F(1, 178) = 8.59^{**}$	16.2	16.4	$F(1, 178) = 1.24$
Wantedness of first sex	(1-10)	6.1	6.4	$F(1, 178) = .6$	6.5	6.3	$F(1, 178) = 1.73$
Length of sexual relationship (in months)	(1-52)	5.7	12.4	$F(1, 178) = 42.45^{***}$	14.3	10.7	$F(1, 178) = 16.10^{***}$
Nonmonogamous relationship	(0, 1)	5.6%	13.7%	$F(1, 178) = 7.70^*$	16.3%	11.6%	$F(1, 178) = 3.31$
Contraceptive Methods Used in First Relationship ^a							
Most effective method used						$\chi^2(2, 342) = 38.21$	
Hormonal method	(0, 1)				41.6%	48.6%	
Condom	(0, 1)				57.5%	49.3%	
Other	(0, 1)				1.0%	2.1%	
Ever used dual methods	(0, 1)				22.7%	27.0%	$F(1, 180) = 1.20$
Switched methods between first and last method	(0, 1)				22.8%	27.1%	$F(1, 165) = 1.17$
Method switching (first to last)						$\chi^2(2, 359) = 38.21^{***}$	
Increased effectiveness	(0, 1)				10.5%	23.3%	
Decreased effectiveness	(0, 1)				12.3%	3.9%	
No method switching	(0, 1)				77.3%	72.9%	

Note. R = respondent.

^a Among respondents who used a method for at least two months ($N = 644$).

$p < .001$.

 $p < .01$.
**
 $p < .05$.
*

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Table 4.
NSFG Logistic Regression Models of Ever Using Contraception and Uninterrupted Contraceptive Use (Weighted)

Variable	Ever Use Contraception	Uninterrupted Contraceptive Use
Partner Characteristics		
Age difference between R and first sexual partner	0.88 *	0.93 *
First partner is different race/ethnicity	1.60	1.10
Relationship Characteristics		
Going steady/engaged at first sex	1.68	1.09
Age at first sex (in years)	1.26 **	1.10
Wantedness of first sex	0.92	0.94
Length of sexual relationship	1.09 ***	0.98 **
Nonmonogamous relationship	1.51	0.83
Family and Individual Controls		
Lived with two biological/adoptive parents at age 14	1.22	0.99
Parents' educational attainment	1.08	1.02
Race/ethnicity		
Non-Hispanic White	(1.00)	(1.00)
Hispanic	0.32 **	0.37 ***
Non-Hispanic Black	0.79	0.76
Non-Hispanic Other		0.86
Grades (1.Fs – 9.As)	1.09	1.18 **
Church attendance at age 14		
Less than once a month or never	(1.00)	(1.00)
One or more times a month	0.93	0.68 *
Discussions with parents on how pregnancy occurs	2.72 ***	0.92
Received 3+ forms of sex education before first sex	1.78	1.58 *
<i>F</i>	$R(16, 163) = 5.77$ ***	$R(17, 162) = 4.81$ ***
<i>N</i>	915	915

Note. R = Respondent.

$p < .001$

 $p < .01$
**
 $p < .05$
*

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Table 5.

Logistic Regression Models of Uninterrupted Contraceptive Use Among Those Who Used a Method in Two or More Months (Weighted)

Variable	Model 1	Model 2
Most effective method used in first relationship		
Hormonal method	1.64	1.29
Condom (ref.)	(1.00)	(1.00)
Other	1.40	1.28
Ever used dual methods	1.21	1.32
Switched method between first method and last method	1.40	
Method switching (first to last)		
Increase effectiveness		3.12 ^{**}
Decrease effectiveness		0.37 [*]
Did not switch methods (ref.)		(1.00)
F	$F(23, 135) = 2.96^{***}$	$F(24, 148) = 3.23^{***}$
N =	644	644

Note. Although not shown, the model included all other covariates shown in Table 4.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 6.
Odds Ratios From Logistic Regression Models, Showing Significant Interactions (Weighted)

Variable	Ever Used Contraception	Uninterrupted Contraceptive Use
Age difference		
Hispanic $\times$ age difference	1.30 *	—
Age difference for whites	0.80 *	—
Age difference for Hispanics	1.04	—
Different race/ethnicity partner		
Hispanic $\times$ different race/ethnicity partner	7.36 **	—
Different race/ethnicity partner for whites	0.64	—
Different race/ethnicity partner for Hispanics	4.71 *	—
Age at first sex		
Hispanic $\times$ Age at first sex	0.72 *	—
Age at first sex for whites	1.46 **	—
Age at first sex for Hispanics	1.06	—
Most effective method use		
Hispanic $\times$ hormonal method		0.22 **
Hormonal method for whites		2.15 *
Hormonal method for Hispanics		0.43

Note. Dashes represent nonsignificant interactions.

* $p < .05$.

** $p < .01$.

*** $p < .001$.