

# Contraceptive Method Choice Among Youth in the United States: The Importance of Relationship Context

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Published online: 2 September 2011  
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**Abstract** We examine the relationship characteristics associated with contraceptive method choice within young people's nonmarital sexual relationships, using data from retrospective relationship histories available in the third wave (2001–2002) of the National Longitudinal Study of Adolescent Health. Data-reduction techniques produce a detailed multidimensional characterization of relationship commitment for nonmarital sexual relationships. We then use multilevel analysis to estimate associations between two key relationship characteristics—relationship commitment and couple heterogamy—and the type of contraceptive method used at last sexual intercourse within each relationship. Results indicate that for a given individual, contraceptive method choice varies across relationships as a function of these characteristics, even after we account for important individual and family characteristics and prior relationship experiences.

**Keywords** Romantic and sexual relationships · Contraceptive behavior · Adolescents and young adults · Commitment · Age and racial/ethnic heterogamy

## Introduction

Rates of unintended pregnancy and sexually transmitted infections (STIs) among adolescents and young adults in the United States remain high and vary considerably across groups, with disproportionately higher rates among disadvantaged young

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**Electronic supplementary material** The online version of this article (doi:10.1007/s13524-011-0061-0) contains supplementary material, which is available to authorized users.

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people (CDC 2004; Darroch et al. 2001; Henshaw 1998; Weinstock et al. 2004). Use of condoms and/or other contraceptive methods is a key protective behavior in the prevention of these negative reproductive health outcomes (IOM 1997). Recent findings indicate that overall contraceptive use among adolescents and young adults is increasing, with the most common method being condoms, followed by the Pill. Although dual method use (defined as the concurrent use of a condom and a hormonal method) is still relatively low, reports of dual method use have also increased (Abma et al. 2004; Mosher et al. 2004). Nonetheless, a substantial proportion of young people continue to engage in unprotected sex; those who use contraception do not do so consistently, and there are persisting differences in use and the type of contraceptive method used by individuals' sociodemographic characteristics (Abma et al. 2004; Everett et al. 2000; Gleit 1999; Mosher et al. 2004).

A growing body of literature indicates that contraceptive behavior also varies by the level of commitment within individuals' relationships and differences in the characteristics of couple members, such as their age and race/ethnicity (e.g., Ford et al. 2001; Howard et al. 1999; Katz et al. 2000; Ku et al. 1994; Manlove et al. 2007; Manning et al. 2000; Soler et al. 2000; Upchurch et al. 1991; Wingood and DiClemente 1998). While this research has greatly improved our understanding of the role of relationships in explaining differential contraceptive practices, it has been generally restricted to the study of either *any* contraceptive use or condom use only. Moreover, it has been limited by the use of dichotomous measures of relationship commitment (e.g., casual versus serious) and by the analysis of single relationships (i.e., current, recent, or first) rather than multiple relationship experiences.

This study overcomes these limitations by using a nationally representative data set of young adults that includes rich retrospective relationship histories spanning mid-adolescence to early adulthood. This study also develops and investigates a more detailed characterization of relationship commitment within young people's nonmarital sexual relationships and examines the specific types of contraceptive methods they use—that is, condoms, hormonal methods, or concurrent use of both (dual method). These approaches permit an examination of the extent to which contraceptive use varies by method, by relationship context, and across relationships.

## Background and Significance

An examination of the romantic and sexual relationships that are formed during the early life course is central to an understanding of young people's sexual and contraceptive behaviors. Involvement in these relationships increases substantially during this period, as does the relative importance of these relationships (Collins 2003; Giordano et al. 2001). They provide a significant context for psychological, social, and sexual development (Connolly and Johnson 1996; Fischer et al. 1996; Furman et al. 1999; Giordano et al. 2001; Graber et al. 1996; Miller et al. 1993), and the patterns and behaviors learned set the stage for future relationships formed in later adulthood (Raley et al. 2007). Most importantly, sexual activity and protective practices are often negotiated within the context of these relationships (Laumann et al. 1994).

The current study draws on key aspects of the life course perspective to conceptualize the links between individuals, their relationships, and relationship-

specific behavior. The life course perspective emphasizes the importance of the timing and sequencing of events that shape individuals' social pathways and developmental trajectories across the life span (Elder 1995; Mayer 2004). In addition, it proposes that individuals make choices conditional on their experiences and characteristics, and within the constraints and opportunities available to them (Elder 1995; Mayer 2004). In this study, we posit that the context of the focal relationship as well as the individual's own characteristics influence the type of contraceptive method used. Relationship commitment and couple heterogamy are posited to be associated with contraceptive method choice because they represent the relationship stage (e.g., just met versus dating exclusively for years) and structure (e.g., older male with younger female). This determines both the motivation and the ability to use a method as well as the type of method used. Individuals' characteristics and family background reflect the beliefs and experiences that they bring to the relationship. These not only shape the propensity to use contraception and which method to use, regardless of the relationship context, but also influence partner selection and the types of relationships that are formed. In accordance with the life course perspective, we also recognize that prior relationship experiences, such as hormonal method use in a previous relationship, may influence subsequent contraceptive choices. Therefore, we control for important individual and family characteristics as well as individuals' prior relationship experiences.

### Relationship Commitment and Contraceptive Method Choice

Nonmarital sexual relationships have been commonly categorized into two general levels of commitment, such as casual versus serious or nonromantic versus romantic. This distinction explains some variation in contraceptive practices, although the direction and magnitude of this association has been mixed in prior studies. Most research has found that individuals in new or casual relationships are more likely to use condoms and to do so consistently, while those in established or serious relationships are less likely to use condoms and more likely to use hormonal methods, yet not necessarily consistently (Fortenberry et al. 2002; Katz et al. 2000; Ku et al. 1994; Macaluso et al. 2000; Ott et al. 2002; Upchurch et al. 1991). Other studies have found that any contraceptive use is more common in serious relationships (Ford et al. 2001; Manlove et al. 2007; Manning et al. 2000). This discrepancy may be explained by two factors.

First, most research has investigated either any contraceptive use or condom use only. However, motivations for using condoms may differ from those for using other methods, such as hormonal methods (e.g., STI versus pregnancy prevention), and these motivations are likely to be relationship-specific (Ott et al. 2002). Focusing on one method at the exclusion of others or combining method types to examine any use relative to non-use ignores this variation. Contemporary young people form a variety of nonmarital relationship types, some of which may be viewed as short-term or casual; others may be viewed as precursors to long-term commitments, such as marriage (Manning et al. 2006, 2005); and still others fall within the two ends of this spectrum. A more comprehensive examination of multiple contraceptive methods is needed to better explain contraceptive behaviors within different types of nonmarital sexual relationships.

Second, dichotomous measures of relationship commitment based on relationship type, such as casual versus serious, are not likely to capture the overall meaning young people ascribe to their nonmarital relationship experiences, and thus may mask variability with implications for contraceptive behavior. It is more likely that relationship commitment occurs along a continuum and that it is intertwined with the strength, frequency, and duration of interactions within the relationship (Kelley et al. 1983).

The current study proposes that young people form nonmarital relationship types of varying levels of commitment, and further, that commitment is composed of multiple interrelated dimensions of relationship-specific interactions. These interactions—operationalized here as time known before first sex, frequency of sex, and relationship duration—have been shown to be independently associated with differential contraceptive practices. Relationships in which the couple has known one another a greater amount of time before first sex are more likely to use any contraception (Manlove et al. 2003). Condom and dual method use become less consistent with more frequent sex and with increased relationship duration, whereas the use of only a hormonal method is more common in longer relationships and in relationships that involve more frequent sex (Bankole et al. 1999; Frost and Darroch 2008; Frost et al. 2007; Katz et al. 2000; Ku et al. 1994; Sayegh et al. 2006; Wilson and Koo 2008).

While this prior research has shown that these indicators of commitment are each associated with contraceptive use, it does not make clear the ways in which they interact with relationship type to influence contraceptive practices. For example, does knowing the partner for a longer time before sex improve the use of contraception even in casual types of relationships, and then if so, for any method or just for condoms? Does frequency of sex differentiate the type of method used even in serious types of relationships? The current study attempts to capture these complexities by developing a single detailed typology of relationship commitment that is composed of multiple dimensions of relationships.

Commitment is hypothesized to be negatively associated with condom and dual method use and positively associated with hormonal method use. In addition, we hypothesize that there are important differences at both ends of the commitment continuum (i.e., least and most) that are evident only with a more detailed measure of relationship commitment. For instance, because casual types of relationships tend to be shorter and involve less frequent sex, it is posited that the distinguishing feature among these relationships is familiarity with one's partner, and that condom use in particular will be higher when the partner is less familiar because of the difficulty in assessing the STI risk associated with having unprotected sex. As a relationship progresses, partners likely know more about each other and may also assume exclusivity, and therefore may find it less important to use condoms because these relationships are believed to be of lower STI risk. Individuals in these more committed relationships may then choose to rely only on a hormonal method instead of a condom or dual method because concern turns to prevention of pregnancy rather than STIs. We also hypothesize that the use of condoms and dual methods even within serious types of relationships will vary by frequency of sex because condoms may be perceived to be more inconvenient or to interfere with sexual pleasure when sex occurs more frequently (Jadack et al. 1997).

## Couple Heterogamy and Contraceptive Method Choice

Although relationships are often formed between individuals with similar characteristics (Laumann et al. 1994), relationships in which partners differ by age and race/ethnicity are not unusual, especially among contemporary American young people (Ford et al. 2003). Differences in these key social markers have implications for contraceptive behaviors. Young women who are involved with older partners are less likely to report using any contraception (Abma et al. 1998; Manning et al. 2000) and less likely to use condoms specifically (DiClemente et al. 2002; Mercer et al. 2009; Miller et al. 1997). And, although few studies have examined racial/ethnic differences between partners in relation to contraceptive use (Ford et al. 2001), there are substantial racial/ethnic differences in sexual mixing patterns and the degree of openness in sexual networks (Ford and Lepkowski 2004; Ford et al. 2002; Laumann and Youm 1999), which may influence protective practices.

Ties between partners with similar characteristics are likely to be closer and last longer than ties between partners who are dissimilar, and similarities reflect shared knowledge and experiences (McPherson et al. 2001), which may make communication and negotiations about sex and contraception easier. Partners who differ in terms of important sociodemographic characteristics like age and race/ethnicity may have different levels of maturity, sexual histories and experiences, social and sexual networks, resources, and status (Ford et al. 2002; Stein et al. 2008). These differences may make communication difficult, pose challenges in agreement on use and the type of method used, and/or affect the power distribution within the relationship and subsequently result in one partner having more control over contraceptive decision-making than the other (Abma et al. 1998; Weisman et al. 1991). Therefore, couple heterogamy is hypothesized to be negatively associated with any contraceptive use and particularly condom and dual method use relative to hormonal method use because the use of condoms requires partner cooperation.

## Data and Methods

### Study Design and Sample

This study uses data from the National Longitudinal Study of Adolescent Health (Add Health; Harris et al. 2003). Add Health's original sampling frame consisted of 80 high schools, with "feeder schools" (e.g., junior high schools) for each identified high school also sampled. The core sample is a probability sample of size 12,105 that is nationally representative of students enrolled in grades 7–12 during the 1994–1995 academic year. Including several oversamples, the Wave I sample size is 20,745; respondents were 11–21 years old. The Wave II sample (survey conducted in 1996) includes all adolescents interviewed at Wave I except for the deletion of 12th graders and one oversample. The Wave II sample size is 14,738; respondents were 12–22 years old. In 2001 and 2002, Wave I respondents, now young adults aged 18–27, were reinterviewed. The Wave III sample size is 15,197. Response rates for each wave are 78.9%, 88.2%, and 77.4%, respectively.

The relationship-level information collected during the Wave III interview is the primary source of data for this study. At Wave III, respondents were asked to identify all romantic and/or sexual relationships since Wave I<sup>1</sup> and then to answer a few questions on each relationship via audio-CASI (computer-assisted self-interview) techniques. Based on the answers to these screener questions, relationships were determined to be *sexual*, determined to be *important*, and/or selected to be part of a *couple* sample by the Add Health investigators. Different additional relationship-specific questions were asked depending on the assigned type(s) (e.g., important and sexual but not part of the couple sample).<sup>2</sup> Because the objective of the current study is to understand the ways in which characteristics of nonmarital sexual relationships are associated with the type of method used, including hormonal methods, the analysis is limited to heterosexual nonmarital relationships that began after Wave I and that had vaginal sex and valid contraception information (25,926 relationships for 9,361 individuals).<sup>3</sup> Individual-level information from the Wave I and III interviews are also used. Wave III measures of gender, race/ethnicity, nativity status, and age at first sex and Wave I measures of religion, family background, and psychosocial factors are used. Because psychosocial factors were collected only for respondents who were 15 years old or older at Wave I, 3,019 younger respondents were excluded from the analytic sample. Another 311 were excluded for missing a Wave III weight. Native Americans composed 1% of the remaining subsample ( $N=61$ ); analysis of this racial/ethnic group was not possible. The final analytic sample includes 5,970 individuals and 16,665 relationships.

## Variable Description and Measurement

### *Contraceptive Method*

Respondents were asked questions regarding contraceptive use at first and last sex for heterosexual relationships in which vaginal sex had occurred. The following methods were queried, and multiple responses were allowed: (a) condom, (b) withdrawal, (c) rhythm, (d) birth control pill, (e) vaginal sponge, (f) foam, jelly, creme, suppositories, (g) diaphragm, with or without jelly, (h) IUD, (i) Norplant, (j) ring, (k) Depo Provera, (l) contraceptive film, and (m) some other method. Assessments of characteristics such as relationship commitment are expected to be more closely aligned with behavior that occurred most recently; therefore, the current study examines contraceptive method use at last sex, collapsed into the following mutually exclusive categories: (1) no method, (2) condom only, (3) hormonal method only, and (4) dual method (condom plus hormonal method). Priority was given to condom and/or hormonal methods because these are the most

<sup>1</sup> We recognize the potential recall bias for relationships that occurred further in the past. We replicated the final model for relationships that were ongoing in the past three years and found comparable results.

<sup>2</sup> This part of the study design was motivated by the different research interests of the Add Health investigators, which resulted in different versions of the questionnaire being administered according to relationship type (sexual, important, or couple). Refer to the Add Health website for details (<http://www.cpc.unc.edu/projects/addhealth/files/w3cdbk/sect19.zip>).

<sup>3</sup> Only 1.5% of relationships did not have valid contraception information (i.e., the information was missing).

effective methods for STI and pregnancy prevention (e.g., condom plus a nonhormonal method was categorized as condom only). Only 1% of relationships involved *only* withdrawal, rhythm, and/or some other method, and these were excluded from the analysis.

### *Relationship Commitment*

A major contribution of the current research is that commitment is conceptualized as categorical and multidimensional. We developed a single detailed typology of relationship commitment using four relationship-specific measures available for all nonmarital sexual relationships: (1) relationship type, (2) length of time the partner was known before first sex, (3) frequency of sex, and (4) duration of relationship. Add Health has improved the measurement of relationships by collecting information about different aspects of relationships, which allowed us to better characterize relationship commitment than was previously possible. The Wave III data, in particular, include a detailed measure of relationship type for nonmarital sexual relationships, with respondents describing their relationships along a five-point continuum: only having sex, dating once in a while, frequently but not exclusively dating, exclusively dating, and cohabiting. This version of relationship type reflects several features of commitment, including time spent together, exclusivity, and living arrangements. We also include the length of time the partner was known before first sex, frequency of sex, and duration as indicators of commitment because these are posited to reflect familiarity, intimacy, and stability.

Cluster analysis was used to develop a single typology of relationship commitment that characterizes nonmarital sexual relationships according to multiple indicators of commitment. The advantage of using cluster analysis is that it does not require *a priori* knowledge about the ways in which different combinations of characteristics should be categorized and allows the unique patterns that exist to be uncovered. We applied *k*-medians clustering, an iterative procedure that partitions data based on the selection of an initial variable from which a set number of groups are defined according to their medians. Each observation is assigned to the group whose median is closest in the initial categorization, and then new group medians are calculated; these steps continue iteratively until no observations change groups. With the iterative clustering method, the number of clusters must be determined prior to the cluster analysis. Because the five-category relationship type is posited to be a key indicator of commitment, we used it as the initial grouping variable. The cluster solution therefore also had five categories or clusters. Confidence in the cluster solution is increased when clusters are stable, when cases in the different clusters differ in terms of other variables not included in the cluster analysis, and when the patterns of associations among the variables within the clusters make sense (Rapkin and Luke 1993). Therefore, cluster analysis was also conducted separately by gender, and while the proportions of relationships categorized in each cluster differed slightly, the patterns were comparable. Split-half sample tests were also conducted, and the results were comparable. We also validated the five-category cluster solution by cross-tabulating it by other relationship measures available for a subset of relationships with information about relationship satisfaction, power, violence, sexual pleasure, and joint activities; all of these measures were statistically



significant and substantively meaningful (e.g., relationship satisfaction was higher in relationships categorized as more committed).<sup>4</sup>

Table 1 presents the distributions of each of the four contributing dimensions by the final cluster solution. The patterns revealed are substantively meaningful and correspond to our hypothesized expectations. The first two clusters are characterized by more casual relationship types (i.e., those described as only having sex or dating once in a while), less frequent sex, and shorter relationship duration, but substantially differed in terms of the length of time in which the partner was known before first sex. Cluster 1 includes relationships in which the partner was known for a shorter amount of time before first sex, whereas Cluster 2 includes relationships in which the partner was known for a longer time before first sex. Clusters 3 and 4 are both characterized by more serious relationship types (i.e., those described as frequently or exclusively dating) but substantially differ in terms of the frequency of sex. Cluster 3 includes relationships that involved less frequent sex, and Cluster 4 includes relationships that involved more frequent sex. Cluster 5 is characterized by exclusively dating and cohabiting relationships that involved frequent sex and were of longer duration. The patterns revealed by the typology suggest that different dimensions are of greater importance for different types of relationships (e.g., time known distinguishes less committed relationships, whereas more committed relationships are distinguished by frequency of sex and/or duration). Modeling the typology rather than each of the four relationship dimensions independently allows for the examination of interactions between these dimensions in a more parsimonious way.

For ease of discussion, the five categories of the relationship commitment typology were assigned abbreviated labels that summarize the modal type of relationship within each category: (1) stranger hook-ups, (2) friend/acquaintance hook-ups, (3) dating with less sex, (4) dating with more sex, and (5) serious dating/cohabiting. The first category, stranger hook-ups, was chosen as the reference category to test the hypothesis that the two least committed relationship types differ in their contraceptive method choices. Significant differences among the other categories of the typology are noted in the tables and the results in order to also highlight differences between the more committed relationships.

### *Couple Heterogamy*

Couple heterogamy is operationalized as age and racial/ethnic differences between partners. Age difference is measured in years and collapsed as follows: (1) partner is three or more years older, (2) partner is within two years of the respondent's age, and (3) partner is three or more years younger. Reference relationships are those in which the partner was within two years of the respondent's age. Racial/ethnic difference was coded 1 if the partner was a different race/ethnicity and 0 otherwise.

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<sup>4</sup> In addition, we performed latent class analysis, which provides fit statistics, in order to compare results to those from the cluster analysis. The latent class analysis indicated a three-cluster solution as having the best fit. In general, this three-class solution is a collapsed version of the five-category cluster solution. We chose the five-category cluster solution because it reveals important variations in contraceptive method choice that are masked by the three-class solution.



**Table 1** Weighted percentage distributions of each relationship characteristic included in the cluster analysis by the final cluster results, Add Health, Wave III (2001–2002)

Relationship Characteristics	Total	Clusters				
		1	2	3	4	5
<b>Relationship Type</b>						
Only having sex	24.9	73.1	69.2	0.0	6.0	0.0
Dating once in a while	8.1	15.7	23.8	2.3	4.4	0.1
Frequently dating	12.0	7.9	7.0	24.5	16.2	1.3
Exclusively dating	34.9	2.9	0.0	57.6	62.3	32.2
Cohabiting	20.1	0.4	0.0	15.6	11.1	66.4
<b>Time Knew Before First Sex</b>						
≤1 day	10.9	48.6	0.0	1.1	4.7	6.3
2–7 days	10.3	26.3	0.0	3.0	11.7	11.2
1–2 weeks	10.2	17.9	0.2	8.2	13.4	10.2
2–4 weeks	12.4	7.2	6.4	15.0	16.4	13.8
1–5 months	24.6	0.0	27.6	35.6	26.8	28.4
6 months–1 year	10.8	0.0	17.1	14.3	10.1	11.7
≥1 year	20.8	0.0	48.7	22.8	16.9	18.4
<b>Frequency of Sex</b>						
Had sex once	19.6	50.9	42.8	19.1	0.0	0.0
≤1 time per week	23.8	19.0	37.2	67.9	0.0	0.0
2 times per week	12.0	10.7	10.3	13.0	19.7	4.5
3 times per week	11.9	5.4	4.5	0.0	29.1	15.1
4–7 times per week	22.1	9.3	3.9	0.0	40.2	47.6
≥8 times per week	10.6	4.7	1.3	0.0	11.0	32.8
<b>Duration of Relationship</b>						
≤1 month	23.3	67.3	49.8	9.0	8.1	0.0
2–4 months	22.8	22.4	29.5	29.1	30.2	2.7
5–12 months	25.1	7.4	13.3	29.9	42.9	22.7
13–27 months	13.9	2.0	4.7	15.0	13.7	29.9
≥28 months	14.9	0.9	2.7	17.0	5.1	44.7
Percentage		16.9	16.1	21.5	24.6	20.9
<i>N</i> (relationships)	16,665	2,777	2,674	3,752	4,044	3,418

Note: Wave III weights; unweighted *N*s.

### Relationship Controls

We control for other relationship-level factors, including whether the relationship was ongoing at the time of the Wave III interview date and whether a pregnancy had occurred in the relationship. Current relationships will be indicative of young adult relationships (Add Health respondents were between the ages of 18 and 27 at Wave III) and thus may be more committed given that as individuals age, they often enter more committed types of relationships (Furman et al. 1999; Ku et al. 1994). A

pregnancy history within a relationship may represent an underlying propensity to use (or not use) contraception; those who have such a history may be poor contraceptors, may have higher pregnancy intentions, or may be more ambivalent about becoming pregnant (Bruckner et al. 2004; Frost et al. 2007). Because past relationship experiences also shape subsequent contraceptive practices (Ku et al. 1994; Manlove et al. 2007), we control for relationship experiences prior to each specific relationship, including number of prior relationships, any hormonal method use at last sex in prior relationships, and any pregnancies in prior relationships. Prior relationship experience measures are based on ordered information from individuals' preceding relationships and therefore vary across relationships.

### *Individual and Family Controls*

Studies consistently demonstrate variation in young people's contraceptive practices by sociodemographic characteristics, family background factors, psychosocial factors, and early risk-related experiences (e.g., Abma et al. 2004; Greenberg et al. 1992; Jones et al. 2005; Mosher et al. 2004; Rostosky et al. 2004; Santelli et al. 1997; Sheeran et al. 1999). We therefore include a comprehensive set of respondent-level individual and family characteristics. All analyses are stratified by the respondent's gender. Other individual and family controls include race/ethnicity, nativity status (coded 1 if foreign born), age (operationalized as age of the respondent at the beginning of the relationship and therefore varies across relationships), religious denomination, religiosity, family structure, parental education (mother's and father's), household income, perceived risk of pregnancy or AIDS, perceived severity of pregnancy, contraceptive self-efficacy, and age at first sexual intercourse.

### *Analytic Strategy*

We used a multilevel modeling approach to investigate the associations between individual- and relationship-level characteristics and the type of contraceptive method used at last sex within each relationship. Level 1 represents relationships, and Level 2 represents individuals (i.e., relationships are nested within individuals). The subscript  $j$  is for individuals ( $j = 1 \dots J$ ), and the subscript  $i$  is for relationships ( $i = 1 \dots n_j$ ). Because the outcome of interest, type of method used at last sex, is a multicategory nominal variable comprising four categories (condom, hormonal method, dual method, and no method), the multilevel multinomial model is

$$\text{Level 1: } \eta_{mij} = \beta_{0j(m)} + \sum_{q=1}^{Q_m} \beta_{qj(m)} X_{qij}, \text{ for } m = 1, \dots, M - 1 \quad (1)$$

$$\text{Level 2: } \beta_{0j(m)} = \gamma_{00(m)} + \sum \gamma_{0s(m)} W_{sj} + u_{0j(m)}, \text{ for } m = 1, \dots, M - 1 \quad (2)$$

At Level 1 or within individuals,  $\eta_{mij}$  is defined as the log-odds of being in the  $m$ th category (e.g., condom) relative to the  $M$ th category (e.g., no method), and  $X$  represents the set of relationship-level characteristics. At Level 2 or between

individuals, the individual-specific intercepts,  $\beta_{0j(m)}$ , are modeled as a function of  $W$ , which represents the set of individual-level characteristics and are allowed to vary randomly across individuals to account for unmeasured individual-level variables that could explain between-individual variation in contraceptive method choice.

Descriptive analysis was conducted using Stata's survey estimation procedures to weight and account for the complex study design of Add Health (StataCorp 2007). Multilevel analysis was conducted in aML 2.0 (Lillard and Panis 2003). Multilevel models are also weighted and account for the clustering of relationships within individuals and individuals within schools.<sup>5</sup> Multilevel models are stratified by gender.<sup>6</sup> Results are presented for all possible contrasts (i.e., each method type compared to no method and each method type compared to each other method type), but only for the two key relationship characteristics: relationship commitment and couple heterogamy. The full set of results, including those for the relationship and individual controls, is available in Online Resource 1.

## Results

Table 2, which presents the weighted descriptive statistics of individual-level characteristics by gender, shows few differences overall. Most young adults reported sexual relationships that began between the ages of 19 and 20, with women's relationships beginning slightly earlier than men's. More than two-thirds of both women and men were white, followed by black, Hispanic, and Asian. About 15% of both women and men reported no religious affiliation during adolescence. The majority grew up with two parents—with either two biological parents or with a biological parent and a stepparent—and about one-quarter lived with their biological mother only. Among those who lived with a mother or father during adolescence, average parental education was 13 years (equivalent to some college). Perception of risk of pregnancy or AIDS associated with engaging in unprotected sex was higher for women than for men, whereas perception of the severity of pregnancy was similar for both genders. Contraceptive self-efficacy was higher among women. And, the average number of sexual relationships for women and men was similar, at about three.

Table 3 presents the weighted distributions of the characteristics of young adults' nonmarital sexual relationships, by gender. Men had more relationships characterized as stranger hook-ups, and women had slightly more relationships characterized as friend/acquaintance hook-ups. Women had more relationships characterized as dating with less sex, and men had slightly more relationships characterized as dating with more sex. Women and men had similar percentages of relationships characterized as serious dating/cohabiting. Women were more likely to have an older partner, whereas men were more likely to have a younger partner. One-fifth of

<sup>5</sup> aML does not have survey estimation procedures comparable to those within Stata. Therefore, the school-based (and thus clustered) design of Add Health is handled by treating the school as an additional level and including the Add Health's post-stratification variable (region of the United States) at the school level.

<sup>6</sup> We also ran separate models that included gender by relationship commitment and couple heterogamy; we discuss only significant gender differences in the text.

**Table 2** Weighted descriptive statistics (percentages or means) of individual characteristics by individual's gender, Add Health, Wave III (2001–2002)

Individual Characteristics	Women	Men
Age at the Beginning of the Relationship**** <sup>a</sup>		
15–16 years	8.2	6.6
17–18 years	28.1	24.9
19–20 years	29.7	30.5
21–22 years	25.1	27.0
≥23 years	8.9	11.0
Race/Ethnicity		
White	69.2	70.0
Black	17.5	15.1
Hispanic	10.2	11.2
Asian	3.1	3.7
Nativity Status		
U.S.-born	96.1	95.6
Foreign-born	3.9	4.4
Religious Denomination as of Wave I		
No religious affiliation	14.7	15.6
Catholic	24.5	26.4
Protestant	55.5	53.0
Non-Christian/other	5.3	5.0
Religiosity as of Wave I***	−0.06	−0.28
Family Structure as of Wave I		
Two parents (biological, or biological and stepparent)	63.7	66.2
Biological mother only	26.2	23.5
Biological father only	3.8	4.2
Other family situations	6.3	6.1
Mother's Education	13.24	13.28
Father's Education	13.64	13.53
Household Income as of Wave I (\$)	46,352	45,980
Perceived Risk of Pregnancy or AIDS as of Wave I***	0.18	−0.18
Perceived Severity of Pregnancy as of Wave I	0.06	0.11
Contraceptive Self-efficacy as of Wave I***	0.18	−0.08
Age at First Sex as of Wave III		
≤14 years	17.5	15.2
15–17 years	51.6	52.1
≥18 years	30.9	32.7
Number of Sexual Relationships per Individual	2.87	2.76
<i>N</i> (individuals)	3,096	2,874

Notes: Wave III weights; unweighted *N*s. Design-based *F*-test significance levels conducted for gender comparisons.

<sup>a</sup>Age of the respondent at the beginning of the relationship varies across relationships.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001

**Table 3** Weighted descriptive statistics (percentages) of relationship characteristics by individual's gender, Add Health, Wave III (2001–2002)

Relationship Characteristics	Women	Men
Relationship Commitment***		
Stranger hook-ups	12.0	21.7
Friend/acquaintance hook-ups	17.8	14.4
Dating with less sex	26.5	16.6
Dating with more sex	23.4	25.7
Serious dating/cohabiting	20.3	21.6
Couple Heterogamy		
Age difference***		
Partner ≥3 years older	37.1	11.6
Partner within 2 years	60.9	72.7
Partner ≥3 years younger	2.0	15.7
Racial/ethnic difference	20.7	19.8
Relationship current	22.5	21.5
Pregnancy occurred***	13.0	7.7
Prior relationship experiences <sup>a</sup>		
Number of prior relationships	1.88	1.87
Any hormonal use in prior relationships	25.7	23.2
Any pregnancies in prior relationships***	10.8	5.7
Type of Method Used at Last Sex***		
No method	26.1	31.5
Condom	37.4	40.2
Hormonal	17.5	14.4
Dual method (condom plus hormonal)	19.0	13.9
<i>N</i> (relationships)	8,736	7,929

Notes: Wave III weights; unweighted *N*s. Design-based *F*-test significance levels conducted for gender comparisons.

<sup>a</sup>Prior relationship experience measures vary across relationships.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

both women's and men's relationships were with a partner of a different race/ethnicity. Contraception at last sex for most women and men involved only a condom. Men had more relationships in which no method was used at last sex, and women had slightly more relationships in which a hormonal method was used, either alone or with a condom.

Tables 4 and 5 present the multilevel multinomial model results in the form of log-odds for the type of contraceptive method used at last sex among women and men, respectively. The first three columns present the results for each method type compared with no method, and the last three columns present the results for each method type compared with another method type. Significant differences between the categories of the commitment typology are noted in the tables with superscripts a–c.

**Table 4** Multilevel multinomial logistic regression results (coefficients) of relationship-specific type of contraceptive method used at last sex, effects of relationship characteristics, Add Health, Wave III (2001–2002), women

Relationship Characteristics	Condom vs. None	Hormonal vs. None	Dual vs. None	Hormonal vs. Condom	Dual vs. Condom	Hormonal vs. Dual
<b>Relationship Commitment</b>						
(ref. = stranger hook-ups)						
Friend/acquaintance hook-ups	0.344*	0.690**	0.258	0.377	-0.062	0.383
Dating with less sex	0.280*	1.068*** <sup>a</sup>	0.663*** <sup>a</sup>	0.789*** <sup>a</sup>	0.406*** <sup>a</sup>	0.333
Dating with more sex	-0.261 <sup>a,b</sup>	1.431*** <sup>a,b</sup>	0.350 <sup>ab</sup>	1.808*** <sup>a,b</sup>	0.753*** <sup>a,b</sup>	1.053*** <sup>a,b</sup>
Serious dating/cohabiting	-0.761*** <sup>a,b,c</sup>	1.491*** <sup>a,b</sup>	-0.001 <sup>b,c</sup>	2.524*** <sup>a,b,c</sup>	1.064*** <sup>a,b,c</sup>	1.542*** <sup>a,b,c</sup>
<b>Couple Heterogamy</b>						
<b>Age difference</b>						
(ref. = partner within 2 years)						
Partner ≥3 years older	-0.236**	-0.215*	-0.418***	-0.004	-0.199*	0.246*
Partner ≥3 years younger	-0.073	-0.200	-0.304	-0.235	-0.327	0.090
<b>Racial/Ethnic Difference</b>						
(ref. = partner same race/ethnicity)						
Partner different race/ethnicity	0.027	-0.397**	-0.027	-0.501***	-0.156	-0.357*
Intercept	-0.621	-3.951***	-2.426***	-3.339***	-1.738***	-0.764

Notes: Weighted results. *N* = 3,096 women and 8,736 relationships. Models include relationship (current status, pregnancy history, prior relationship experiences) and individual (sociodemographic, family background, psychosocial, age at first sex) controls.

<sup>a</sup>Significantly different from friend/acquaintance hook-ups at *p* < .05.

<sup>b</sup>Significantly different from dating with less sex at *p* < .05.

<sup>c</sup>Significantly different from dating with more sex at *p* < .05.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001

**Table 5** Multilevel multinomial logistic regression results (coefficients) of relationship-specific type of contraceptive method used at last sex, effects of relationship characteristics, Add Health, Wave III (2001–2002), men

Relationship Characteristics	Condom vs. None	Hormonal vs. None	Dual vs. None	Hormonal vs. Condom	Dual vs. Condom	Hormonal vs. Dual
Relationship Commitment (ref. = stranger hook-ups)						
Friend/acquaintance hook-ups	-0.247*	0.263	-0.011	0.526**	0.306	0.219
Dating with less sex	0.427*** <sup>a</sup>	1.111*** <sup>a</sup>	0.824*** <sup>a</sup>	0.692***	0.453**	0.177
Dating with more sex	-0.419*** <sup>b</sup>	1.044*** <sup>a</sup>	0.474** <sup>a,b</sup>	1.679*** <sup>a,b</sup>	1.163*** <sup>a,b</sup>	0.356
Serious dating/cohabiting	0.553*** <sup>a,b</sup>	1.722*** <sup>a,b,c</sup>	0.754*** <sup>a,c</sup>	2.553*** <sup>a,b,c</sup>	1.626*** <sup>a,b,c</sup>	0.765*** <sup>a,b,c</sup>
Couple Heterogamy						
Age difference (ref. = partner within 2 years)						
Partner ≥3 years older	-0.460***	-0.364*	-0.629***	0.117	-0.146	0.212
Partner ≥3 years younger	-0.037	-0.333*	-0.615***	-0.285*	-0.593***	0.343*
Racial/Ethnic Difference (ref. = partner same race/ethnicity)						
Partner different race/ethnicity	-0.018	-0.056	0.053	-0.074	0.042	-0.104
Intercept	0.070	-3.366***	-0.574	-3.474***	-0.677	-2.032***

Notes: Weighted results. N = 2,874 men and 7,929 relationships. Models include relationship (current status, pregnancy history, prior relationship experiences) and individual (sociodemographic, family background, psychosocial, age at first sex) controls.

<sup>a</sup>Significantly different from friend/acquaintance hook-ups at  $p < .05$ .

<sup>b</sup>Significantly different from dating with less sex at  $p < .05$ .

<sup>c</sup>Significantly different from dating with more sex at  $p < .05$ .

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



The results for women (Table 4) indicate substantial variation in the type of method used at last sex by relationship commitment and couple heterogamy. Friend/acquaintance hook-ups were more likely than were stranger hook-ups to be associated with condom use relative to no method, as were relationships characterized by dating with less sex. Those in serious dating/cohabiting relationships, however, were less likely than those participating in stranger hook-ups to use condoms relative to no method. Those involved in relationships that were more committed than stranger hook-ups were more likely to use a hormonal method. Those involved in both types of dating relationships (less or more sex) were more likely to use a dual method relative to no method. There were also notable differences between method types. For instance, those in both types of dating relationships and serious dating/cohabiting relationships were more likely to use a hormonal method, either alone or with a condom, relative to using a condom only. In addition, those in relationships characterized as dating with more sex and in serious dating/cohabiting relationships were more likely to use a hormonal method alone than with a condom.

Furthermore, the other commitment typology categories significantly differed from one another (as denoted by superscripts a–c), highlighting important differences at the both ends of the commitment continuum. For instance, among women in the two types of dating relationships, those with less sex were more likely to report condom and dual method use and less likely to report hormonal method use than those with more sex. There was also a significant difference between the two most committed types of relationships: condom and dual method use were higher in the dating-with-more-sex relationships than in the serious dating/cohabiting relationships; recall that both of these categories had relationships with somewhat comparable sex frequency, but the latter included relationships of longer duration and more cohabiting relationships.

Individuals in relationships with partners who were older were less likely to have used any method relative to no method. Although having an older partner did not differentiate hormonal method use from condom use, it was negatively associated with dual method use relative to using a hormonal method only. Those in interracial relationships were less likely to use a hormonal method relative to no method and relative to a condom or a dual method.

The results for men (Table 5) also indicate substantial variation in contraceptive method choice by relationship commitment and couple heterogamy, and for the most part, they were similar to those for women, with a few notable exceptions. Friend/acquaintance hook-ups were *less* likely to use condoms relative to no method than were stranger hook-ups. Serious dating/cohabiting relationships were *more* likely than stranger hook-ups to use condoms (alone or with a hormonal method) relative to no method. Serious dating/cohabiting relationships were also more likely to use condoms or dual methods than dating-with-more-sex relationships. Similar to the results for women, having an older partner was negatively associated with any method versus no method among men's relationships, but unlike for women, having an older partner did not differentiate each method type compared with the other (i.e., hormonal versus dual method). And a racial/ethnic difference between partners was not significantly associated with contraceptive method choice.

## Discussion

The nonmarital sexual relationships that are formed during adolescence and young adulthood are diverse in terms of level of commitment and in terms of age and racial/ethnic heterogeneity—perhaps the most diverse in the life course. This is consistent with the life course perspective: adolescence/young adulthood is a transitional time during which individuals experience increases in the quantity and diversity of social roles and relations (Elder 1995) and engage in greater sexual experimentation (Fergus et al. 2007). Because there is continuity in relationship experiences between adolescence and young adulthood (Raley et al. 2007), and because these early relationships are neither trivial nor fleeting (Collins 2003; Furman et al. 1999; Giordano et al. 2001), this diversity requires additional exploration.

Our multidimensional measure of relationship commitment reveals important differences in contraceptive practices. Although those in less committed relationships are more likely to use condoms and those in more committed relationships are more likely to use hormonal methods (e.g., Fortenberry et al. 2002; Ku et al. 1994; Ott et al. 2002), we find substantial variation within these two general levels of commitment. For instance, among women in hook-up relationships, familiarity with partners improves condom and hormonal method use. This is consistent with the finding that young people who know their partners better are more likely discuss contraception (Kaestle and Halpern 2005), and those who communicate about contraception are more likely to use contraception (Manlove et al. 2003; Widman et al. 2006), but it highlights the significance of familiarity for the least committed relationships. Among women in dating relationships, frequency of sex decreases both condom and dual method use. This corroborates the negative association others have found between condom use and frequency of sex (Katz et al. 2000; Sayegh et al. 2006) while also providing evidence that the association persists even in relationships with comparably high levels of commitment. And, among women in the most committed relationships with similar sexual frequency, relationship duration decreases both condom and dual method use. These findings illustrate that the dichotomies previously used to capture relationship commitment may not adequately portray the variation in commitment within nonmarital sexual relationships.

Patterns of associations between the multidimensional relationship commitment typology and contraceptive method choice are similar for women and men, with a few important differences. In the least committed relationships, familiarity increases condom use among women but decreases it among men. Thus, familiarity seems especially beneficial for women, who may be better able to negotiate condom use when casual partners are well-known. On the other hand, in the most committed relationships, condom and dual method use is lower for women but not for men. This suggests that negotiating condom use in a committed relationship may be more difficult for women than for men. Those in serious relationships may be hesitant to use condoms because they associate their use with infidelity, distrust, or casual sex (Gilmore et al. 1996; Hynie et al. 1998; Wingood and DiClemente 1998; Woodsong and Koo 1999); these issues may be more salient for women because condom use requires partner cooperation.

Similar to other studies (Abma et al. 1998; Manning et al. 2000), this study finds that age heterogamy is negatively associated with the use of any contraception, but also finds that it differentiates method types. Use of any method is lower for both women and men with older partners, suggesting that an age difference may hinder communication regardless of whether the older partner is male or female and regardless of the method type. Alternatively, an age differential may simply give more power to the older partner to dictate the method used or whether a method is used at all. Because condom and dual method use tend to decrease with age and hormonal methods increase with age (Abma et al. 2004; Ku et al. 1994; Santelli et al. 1997), use of these methods may be lower in relationships in which the male is older and the female is younger. Women with older partners, however, are less likely to report dual method use relative to hormonal method use. Women's ability to negotiate condom use when hormonal methods are already being used may be more difficult when the partner is older, even net of differences in commitment. Men with younger partners are less likely to report that their partner used a hormonal method. This may be because younger women tend not to use hormonal methods, or because these older men do not know that their partners are using hormonal methods. In sum, both men and women appear to have difficulty communicating about contraceptive issues with their partners; this deserves greater attention, since communication improves use (Manlove et al. 2003; Widman et al. 2006).

Although this study advances our understanding of the association between relationship context and contraceptive method choice, it also has limitations. Recall bias is often a concern with retrospective data. Individuals may remember and thus report salient long-term relationships but overlook casual short-term relationships. Potential endogeneity issues should also be acknowledged. For instance, the reason women in less committed relationships who knew their partner for longer before sex are more likely to use contraception may be that those who are more risk-averse are more likely both to use contraception and to wait longer in a relationship to have sex. In addition, there may be an underreporting of hormonal methods by men; men in less committed relationships may report lower hormonal method use among their partners because they tend to be less aware of their partners' use of this method than are men in more committed relationships. And while the results of the current study suggest that our typology of relationship commitment is substantively meaningful for the study of contraceptive behaviors within nonmarital sexual relationships—and while our findings are consistent with prior research and extant theory—the underlying mechanisms remain unidentified. That is, factors underlying the typology, such as relationship quality, gender equity, the presence of intimidation or violence, and/or communication style (Manlove et al. 2003, 2007; Soler et al. 2000; Widman et al. 2006; Wingood and DiClemente 1998), may help explain the observed associations.

An important contribution of this study is its examination of relationship-specific contraceptive practices within a multilevel framework and the subsequent finding that individuals may behave differently in different relationships. Future research endeavors would benefit from richer data on romantic and sexual relationships, which would allow for an investigation of the potential mechanisms by which the relationship context influences contraceptive behaviors. Data that include attitudinal indicators of commitment, such as relationship quality and satisfaction, are still

lacking relative to behavioral indicators like frequency of sex and duration. In addition, questions that go beyond asking about contraceptive use at first and last sex are necessary to better understand changes in contraceptive behaviors across time within a given relationship.

The findings from this study also suggest the need for programs that are relationship-focused, even if only one partner in the relationship is involved in the program. The relationship context is shown to have important associations with contraceptive practices, which remain even after controlling for a comprehensive set of individual and family characteristics and prior relationship experiences. This suggests the need for programs that promote the discussion of young people's specific relationship experiences, particularly the characteristics of their partners and the types of relationships in which they are involved, and that encourage the involvement of their partners. For instance, given that an age difference between partners was detrimental to the use of any contraception, more-targeted interventions that provide young people with the skills to discuss and negotiate contraception in such heterogamous relationships would be extremely beneficial. In addition, these interventions should be geared toward both women and men because men with older partners are also less likely to report the use of contraception. Moreover, the results indicate that the patterns of associations for both relationship commitment and couple heterogamy vary by gender and, therefore, programs should be responsive to these differences.

**Acknowledgments** The research on which this article is based was supported by a pre-doctoral fellowship to Yasamin Kusunoki from the California Center for Population Research Training Program while she was a graduate student at the University of California, Los Angeles, which was supported by a grant from NICHD (T32 HD007545) and by two research grants to Dawn M. Upchurch funded by NICHD (R01 HD36993 and R01 HD41886). An NICHD Postdoctoral Fellowship (T32 HD007339) at the Population Studies Center at the University of Michigan provided additional support to Yasamin Kusunoki. The authors thank Jennifer Barber, N.E. Barr, Sarah Burgard, David Harding, and three anonymous reviewers for their helpful comments. An earlier version of this article was presented at the annual meeting of the Population Association of America in Philadelphia, March 31–April 2, 2005. This research uses data from Add Health, a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris, and funded by a grant (P01-HD31921) from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 17 other agencies. Special acknowledgment is due to Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Persons interested in obtaining data files from Add Health should contact Add Health, Carolina Population Center, 123W. Franklin Street, Chapel Hill, NC 27516–2524 (addhealth@unc.edu). No direct support was received from Grant P01-HD31921 for this analysis.

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