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The Dynamics of Intimate Relationships and Contraceptive Use During Early Emerging Adulthood

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Abstract

We investigate the immediate social context of contraceptive behaviors: specifically, the intimate relationship. We use the Relationship Dynamics and Social Life (RDSL) study (2008–2012), based on a random sample of 1,003 women ages 18–19 residing in a Michigan county. Women were interviewed weekly for 2.5 years, resulting in an age range of 18–22. We test three sets of hypotheses about change over time within a relationship, using relationship-level within-between models, which compare a couple's contraceptive behaviors across different times in the relationship. First, we find that a couple is less likely to use contraception when the relationship is more intimate and/or committed and that a couple becomes less likely to use contraception over time, regardless of intimacy and commitment. Second, we find that a couple using contraception becomes increasingly likely to choose hormonal over coital methods, but this change occurs as a relationship endures and is unrelated to intimacy and/or commitment. Third, we find that a condom-using couple's consistency does not decline when there is conflict; rather, consistency of condom use declines over time regardless of the relationship's characteristics. We also demonstrate that conflict and power imbalance increase reliance on hormonal methods among those using contraception; conflict decreases consistency among withdrawal (but not condom) users; and nonmonogamy increases reliance on condoms and decreases withdrawal consistency. The strong and consistent link between duration and contraceptive behaviors—regardless of intimacy, commitment, conflict, or power imbalance—suggests that the continual vigilance required for long-term contraceptive use is difficult during early emerging adulthood.

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Conflict of Interest The authors declare that they have no conflict of interest.

Compliance With Ethical Standards

Ethics and Consent The authors report no ethical issues.

Keywords

Contraception; Emerging adulthood; Transition to adulthood; Relationship dynamics

Introduction

Intimate relationships are ubiquitous during adolescence and emergent adulthood, with nearly three-quarters of young people participating in an intimate partnership of some type by age 19 (Guttmacher Institute 2014). These relationships become increasingly important during early emerging adulthood (Arnett 2010; Scott et al. 2011) as young people transition to independence, away from their parents' influence (Roberson et al. 2017; Shulman and Connolly 2013). Although they constitute a significant social context for healthy psychosocial and sexual development, intimate relationships during this period of the life course are also more likely to include negative experiences compared with other periods of the life course. Approximately one-third of women experience intimate partner violence—sexual assault, physical assault, or coercive control—in their lifetime, with more than 70% of these experiences first occurring before age 25 (Breiding et al. 2014). Reproductive coercion—interference with women's autonomous control over their own sexual behavior, contraceptive use, and whether a pregnancy is carried to term—is also common at these ages (Barber et al. 2018; Miller et al. 2010a). It is this ubiquitous, important, and sometimes violent or coercive setting where most young people make an unusually dense set of consequential decisions about their future family formation, education, career, and other areas of life.

The vast majority of young emerging adult women want to avoid or postpone pregnancy (Barber et al. 2019). However, although undesired pregnancy rates in the United States are high at all ages, they are particularly high at ages 18–19, 20–24, and 25–29: respectively, 71, 81, and 66 per thousand, compared with 20 for ages 15–17, 43 for ages 30–34, and 16 for ages 35 and older (Finer and Zolna 2016). For couples who are sexually active, consistent use of an effective contraceptive method is crucial to prevent undesired pregnancy. About one-half of unintended pregnancies occur to couples who were not using any contraceptive method, and about one-half occur to couples who were using contraception but not consistently (during every instance of sexual intercourse) (Guttmacher Institute 2018; Henshaw 2009; Jones et al. 2012; Martinez et al. 2011; Scott et al. 2011).

This striking disconnect between what young emerging adult women want (to avoid pregnancy), what they do (use contraception inconsistently or not at all), and the result (unintended pregnancy), alongside the importance of their intimate relationships as the immediate social context for these decisions, motivates our analyses of how intimate relationships shape contraceptive behaviors among women who do not want a pregnancy.

Background

Previous studies have found that contraceptive behaviors vary across intimate relationship types in three overarching patterns.[1] First, couples in serious relationships use contraception less than couples in casual relationships (Kusunoki and Upchurch 2011; Manlove et al.

2011, 2014; Sayegh et al. 2006; Upadhyay et al. 2016; Wildsmith et al. 2015). Second, this behavior is particularly true for use of condoms: serious couples are less likely to use condoms and are correspondingly more likely to use hormonal methods than their counterparts in casual relationships (Kusunoki and Upchurch 2011; Manlove et al. 2011, 2014; Sayegh et al. 2006; Upadhyay et al. 2016; Wildsmith et al. 2015). Third, conflictual and power-imbalanced couples who use condoms do so less consistently than their more harmonious and power-balanced peers (Manlove et al. 2011, 2014; Manning et al. 2009; Wildsmith et al. 2015).

Although some of the aforementioned studies used data sets based on longitudinal surveys or retrospective calendars, none analyzed change over time in contraceptive use within relationships. Rather, they used point-in-time measures, or retrospective summaries, to link characteristics of a relationship (e.g., currently cohabiting vs. dating, overall seriousness of the relationship) to contraceptive use in that relationship (e.g., use at last sex, ever had sex without contraception, overall level of contraceptive use within a relationship), and used comparisons across different relationships to *infer* that contraceptive use changes over time within relationships. Qualitative researchers have also asked young women to recall their contraceptive use with current and past partners; rather than focusing on point-in-time summaries, though, they tended to characterize contraceptive use *overall* during those relationships (e.g., always consistent vs. ever inconsistent or generally consistent vs. inconsistent) (England et al. 2016; Reed et al. 2014; Sassler and Miller 2017), rather than *change* across relationships.[2]

Our first novel contribution to the literature is to develop and test a detailed set of explicitly dynamic hypotheses based on these three overarching patterns: (1) a couple *becomes decreasingly likely* to use contraception as the relationship becomes more intimate/committed, (2) a couple that continues to use contraception *becomes decreasingly likely* to use condoms as the relationship becomes more intimate/committed, and (3) a couple that continues to use condoms does so less consistently *during times of* conflict/power imbalance than when relationships are more harmonious and/or balanced. Until now, quantitative researchers have lacked the survey data—repeated observations of couples at different time points within their relationship—required to directly test hypotheses about these changes across time within a relationship.[3] As a result, whether and how contraceptive behaviors actually *change* within this important and dynamic social context has remained elusive. We analyze newly available data from the Relationship Dynamics and Social Life (RDSL) project (2008–2012), which features detailed weekly interviews with a population-based sample of women ages 18–19 in a Michigan county for 2.5 years during early emerging

[1]We focus here on contraceptive use to prevent pregnancy and thus analyze only heterosexual intercourse. Other research has documented lower levels of contraceptive use among nonheterosexual women (compared with heterosexual women) in their heterosexual sexual encounters (Ela and Budnick 2017).

[2]One important exception is Edin and Kefalas' (2005) study of unmarried mothers, which documented their recollections of becoming less consistent coital contraceptive users over time as their relationship with the father reached "the next level of commitment."

[3]One exception is the Continuity and Change in Contraceptive Use study, a four-wave, nationally representative longitudinal study (2012–2014) of ~4,500 women ages 18–39 (Jones 2018; Jones et al. 2015). Another is the Border Contraceptive Access Study, which selected ~1,000 women using two pharmacies for oral contraceptives and interviewed them four times over nine months (Potter et al. 2010). These data sets have not been used to study the links between changing intimate relationships and contraceptive use.

adulthood (18–22 years old). These intensive longitudinal data allow us to analyze changing contraceptive behaviors over time within a relationship.

Our second novel contribution to this research is to dissect these overarching patterns of contraceptive use, disentangling intimacy/commitment and conflict/power imbalance from changes in contraceptive behavior that occur as a relationship endures (i.e., with duration) regardless of its changing character. Although nearly all research on intimate relationships and contraceptive use has considered duration to be important, cross-sectional analyses cannot disentangle duration from other qualities of intimate relationships because duration does not vary independently of these qualities when everything is measured simultaneously. Instead, duration is frequently used alongside other indicators of intimacy or commitment to describe the overall character of a relationship (e.g., Manlove et al. 2014). Approaches like this are uniquely important because they reveal how different aspects of relationships combine to influence contraceptive behaviors. What these approaches cannot tell us, though, is whether a couple comes to rely on hormonal methods when they become serious, or whether they do so over time regardless of whether they become serious. First, we consider whether increasing intimacy/commitment leads to decreasing contraceptive use or whether a couple becomes decreasingly likely to use contraception over time regardless of whether their relationship becomes more intimate or committed. Second, we similarly consider whether increasing intimacy/commitment decreases reliance on condoms or instead a couple becomes decreasingly likely to use condoms over time regardless of whether their relationship becomes more intimate or committed. And third, we consider whether conflict and power imbalance reduces consistency among condom users simply because of co-occurring changes in intimacy/commitment or the passage of time.

Conceptual Framework

In our framework, a woman or couple first considers whether to use contraception. Second, among those who decide to use contraception, they choose a specific method. And, third, if the method is coital-specific, they consistently or inconsistently enact its use when they have heterosexual intercourse. We integrate the three overarching patterns discussed earlier with these contraceptive behaviors—overall levels of contraceptive use, hormonal methods versus condoms among users, and consistency among condom use—and systematically explore their links with intimacy/commitment, conflict/power imbalance, and duration. Thus, we also test several new hypotheses about (1) intimacy/commitment and consistency of use among coital method users, (2) conflict/power imbalance and overall levels of contraceptive use as well as hormonal versus coital method choice among those using contraception, and (3) duration and all three aspects of contraceptive behavior.

Differences Among Contraceptive Methods

Birth control pills, condoms, and withdrawal are the most common contraceptive methods during young emerging adulthood (Guttmacher Institute 2018).[4] Although long-acting reversible contraceptive (LARC) methods (e.g., IUDs and implants) are highly effective,

[4]Guttmacher (2018) reported that among current contraceptive users aged 15–19, 55% were using condoms, 35% used oral contraceptives, 20% used withdrawal, 8% used hormonal injectable/patch/ring, and only 3% used an IUD.

they remain rare among adolescents and young adults (Finer et al. 2012; Kusunoki et al. 2016). Because other forms of hormonal contraception—for example, injectables, the patch, and the ring—share many similarities with oral contraceptives, we discuss them as a group (hormonal methods) and note the characteristics in which they differ. In developing our hypotheses, we leverage the differences among hormonal methods, condoms, and withdrawal to point toward specific mechanisms that may explain their links with intimacy/commitment, conflict/power imbalance, and duration.

Specifically, these contraceptive methods vary in terms of their effectiveness, sexually transmitted infection (STI) prevention, accessibility, required vigilance, ease of clandestine use, cost, accessibility, and side effects. Hormonal methods are more effective than condoms and withdrawal: the typical use failure rate of oral contraceptives is 9% versus 18% and 22%, respectively, for condoms or withdrawal (Trussell 2011). Condoms, however, are the only method that prevents STIs. All three methods require a relatively high level of vigilance (with non–oral contraceptive hormonal methods requiring slightly less than oral contraceptives) but vary in terms of accessibility. Oral contraceptives must be taken daily before (and regardless of) intercourse. Condoms and withdrawal, on the other hand, are used only at the time of intercourse but must be used every time. Although hormonal methods can be procured only with a prescription, and usually a clinic visit, condoms are procured ahead of time (i.e., at a store), and withdrawal is not procured at all. Hormonal methods do not require a partner's cooperation. Although condoms and withdrawal are impossible to enact without the direct cooperation of a partner at the time of intercourse, no temporary contraceptive method is 100% clandestine: even packets of oral contraceptives must be hidden somewhere. Withdrawal is the cheapest method, hormonal methods may be very inexpensive or even free depending on health insurance coverage, and condoms are relatively inexpensive (as inexpensive as roughly 50 cents/condom). In terms of side effects, hormonal methods tend to affect women's menstrual cycle and hormone levels (amenorrhea/menorrhagia, weight gain, and mood), and condoms and withdrawal mainly interfere with sexual pleasure.

We describe how the nature of these methods might influence whether a couple uses any contraception and, if so, whether they choose a hormonal versus coital method and/or whether they are able to use a coital method consistently. We detail how intimacy, commitment, conflict, power imbalance, and duration are likely to affect how couples weigh the advantages and disadvantages of these common methods.

Intimacy and Commitment

Nearly all research on intimate relationships and contraceptive use has focused on the level of intimacy and commitment between partners. However, researchers have conceptualized intimacy and commitment in many different ways. For example, the 2006–2010 National Survey of Family Growth (NSFG) asked respondents to choose one of the following to characterize their relationship type at first intercourse: married, engaged, living together in a sexual relationship but not engaged, going steady, going out once in a while, just friends, just met, or something else (Gibbs 2013). This typology combines many distinct characteristics, including duration, time spent together, level of intimacy, and commitment to being

monogamous. Others have used measures of how likely a relationship is to last (Manlove et al. 2014; Wildsmith et al. 2015); the importance of the relationship or love for the partner (Manlove et al. 2014; Manning et al. 2009; Sayegh et al. 2006; Wildsmith et al. 2015); whether the couple has discussed having children together (Hock-Long et al. 2012); or descriptions using survey respondents' own words, such as *baby daddy, sugar daddy,* or *friend with benefits* (Hock-Long et al. 2012; Upadhyay et al. 2016). This research demonstrated that contraceptive use is lower in more intimate and committed relationships than in casual relationships and that condom use is lower and hormonal method use is correspondingly higher in serious versus casual relationships.

Researchers have posed many dynamic explanations for these cross-sectional differences. First, partners may agree on or assume monogamy as their relationship becomes more serious, they spend more time together (and thus know their partner's whereabouts), and perhaps even move in together. With increasing trust in a partner's monogamy, couples may become less likely to use condoms or to use them less consistently if they believe their STI risk is decreasing (Ku et al. 1994; Manlove et al. 2011; Manning et al. 2009; Reed et al. 2014; Wildsmith et al. 2015). Because young people associate condom use with infidelity, distrust, or casual sex because of their ability to prevent STIs, negotiating their use in a relationship where both partners have committed to being monogamous may be difficult or awkward (Brady et al. 2009; Ewing and Bryan 2015).

Second, as motivation turns away from preventing STIs and solely toward preventing pregnancy, couples may switch to hormonal methods because they are more effective (Harvey et al. 2017; Hock-Long et al. 2012; Kusunoki and Upchurch 2011). Recent research has shown that desire for pregnancy increases within a relationship as it becomes more intimate and committed (Barber et al. 2019), and this is a strong predictor of contraceptive use (Moreau et al. 2012). Even among couples who want to prevent pregnancy, tolerance of an undesired pregnancy may increase as a relationship becomes more intimate and committed (Edin and Kefalas 2005; Weitzman et al. 2017). If so, then contraceptive use would decline as relationships become more intimate and committed. Further, although previous research has not examined this possibility, contraceptive use may also become less consistent if the desire to avoid pregnancy becomes weaker (Miller 1973; Moreau et al. 2012).

Third, use of coital-specific methods may decrease as intimacy and commitment increase because sexual frequency is higher in these relationships (e.g., cohabitation, marriage), and the vigilance required and cost of coital-specific methods increases in parallel (Wildsmith et al. 2015). Frequent sex may also heighten sensitivity to condoms' interference with sexual pleasure (Lehmiller et al. 2014; Randolph et al. 2007; Reed et al. 2014).

Conflict and Power Imbalance

Negative relationship qualities have also been conceptualized in many ways, but two themes pervade most of this research: conflict and power. These concepts are difficult to disentangle both conceptually and empirically. When partners disagree, it may result in conflict. Conflict may result in one partner asserting or demonstrating, perhaps physically, dominance or power over the other (Overall et al. 2016). Power-imbalanced relationships in which the

male partner dominates the decision-making involve more disrespect, threats, and physical assault than more balanced relationships (Kusunoki et al. 2010). Nonmonogamous male partners show their female partners more disrespect, threaten them with violence, and physically assault them more than monogamous men (Kusunoki et al. 2010).

Much of the research on conflict and power imbalance has focused on consistent (or not) condom use. Women in conflictual relationships (involving, e.g., mistrust, problem drinking, jealousy) are less likely to report that they use condoms "every time we have sex" than women in less conflictual relationships, and they are also less likely to report that they used condoms the most recent time they had sexual intercourse (Manlove et al. 2011; Wildsmith et al. 2015). Power imbalance (indicated, e.g., by controlling behaviors, perceived partner inferiority) and couple heterogamy (e.g., age differences, education asymmetry) have also been linked to lower probability of condom use at most recent sexual intercourse (Kusunoki and Upchurch 2011; Manlove et al. 2007, 2011; Wildsmith et al. 2015). Women in physically violent relationships are less likely to use contraception, particularly condoms, compared with women in nonviolent relationships (Kusunoki et al. 2018).

Conflict and power imbalance remain largely unexplored in terms of overall levels of contraceptive use (for important exceptions, see Kusunoki et al. 2018 and Manlove et al. 2011) and in terms of whether those using contraception choose hormonal or coital methods. Further, because prior research has analyzed contraceptive use at one point in time (or a single summary measure across the entire relationship), it is unknown whether conflict or power imbalance actually *changes* a couple's contraceptive behavior (relative to when they are more harmonious or balanced) or whether instead the types of couples who tend to experience conflict or power imbalance are also the types of couples who tend to be inconsistent contraceptive users.

The cooperative nature of coital methods likely influences the consistency with which couples are able to use them as well as whether a couple wanting to prevent pregnancy uses any contraception or chooses a coital method. The male partner must agree to wear a condom or withdraw during intercourse, which may require more communication between partners than hormonal methods, which can be implemented by women alone. Although cross-sectional patterns have largely been interpreted as representing relatively stable individual- or relationship-level differences in communication, impaired decision-making, or inability to negotiate (Manlove et al. 2011; Manning et al. 2009; Wildsmith et al. 2015), conflict or power imbalance may *change* a couple's behavior for several reasons.

For example, Miller described two specific times within a relationship when contraceptive use is likely to be particularly difficult (Miller 1973). First, during times of crisis, couples may abandon even stable patterns of contraception as a result of the stress of conflict or violence. These times may even be accompanied by a conscious or unconscious desire to get pregnant in an attempt to save the relationship, which could decrease a couple's desire or ability to remain vigilant with any contraceptive method and may especially decrease the use of highly effective methods. Second, following a breakup, a couple may be less prepared to use contraception than usual during a "surprise weekend" or last-minute effort to reconcile. Such a situation would especially affect the use of hormonal methods and condoms, which

require advance preparation. Indeed, a diverse group of young men expressed that the "unpredictable nature of relationships" makes condom use particularly difficult (Raine et al. 2010:373).

In addition, women perceive their male partners as desiring pregnancy when they are being threatened or assaulted (Barber et al. 2018; Miller et al. 2013), and they expect less control over sex and contraceptive use during violent periods within a relationship compared with nonviolent periods within that same relationship (Kusunoki and Barber 2019). This is likely to lead to reproductive coercion: interference with contraception and/or pressuring a partner to become pregnant or to end a pregnancy (de Bocanegra et al. 2010). Women who strongly want to prevent pregnancy may also be more likely to use hormonal methods if they are experiencing violence or reproductive coercion, given the more clandestine nature of these methods.

And, of course, condoms' unique ability to prevent STIs may influence whether couples using contraception choose condoms or whether those who use condoms are motivated to do so consistently. If nonmonogamous behavior—sexual intercourse with a partner outside the dyad—increases perceived risk of an STI, then it will likely also increase condom use and consistency. Senn et al. (2009) found that women who thought their partner was nonmonogamous were more consistent condom users than those who believed their partner was monogamous. Weitzman et al. (2019) showed that women are also more likely to use condoms when they themselves are nonmonogamous. Women also expect to have less control over sex and contraceptive use when they believe their partner is having sex outside the dyad relative to when they believe that same partner is behaving monogamously (Kusunoki and Barber 2019), but they also tend to perceive the partner as having less desire for pregnancy when they are nonmonogamous (Barber et al. 2019).

Nonmonogamous behavior in a relationship where the partners have *not* committed to being monogamous might increase overall contraceptive use if women especially want to prevent pregnancy with such a partner. A partner's nonmonogamous behavior in a relationship when the partners *have* committed to being monogamous may cause the same type of unpredictability, stress, or desire to save a relationship as with other types of conflict or power imbalance.

Duration

In cross-sectional research on contraceptive use, hypotheses about intimacy, commitment, and duration are typically intertwined: long-term relationships that are intimate and committed are compared with newer relationships that are not (yet) intimate and committed. In this conceptualization, duration itself signifies commitment. However, a relationship may be long-lasting regardless of whether a couple decides to commit to monogamy, spends a lot of time together, or coresides. Conversely, a couple may commit to being monogamous, sleep in the same bed together every night, or share an address even early in a relationship.

The effects of intimacy and commitment can be disentangled from those of duration by (1) comparing contraceptive behaviors while a couple is intimate and committed with their contraceptive behaviors when they are less so, around the same duration within their

relationship, or (2) by comparing contraceptive behaviors at earlier and later times during their relationship that are similar in terms of intimacy and commitment. This fixed-effects approach permits us to examine whether contraceptive behavior simply changes over time regardless of other measured characteristics of the relationship.

Contraceptive behaviors may change over time, regardless of whether the relationship itself changes, for many reasons. First, although we limit our analyses to couples who do not want a pregnancy, even those couples may become more open to "accidental" pregnancies over time. This notion is consistent with research showing that couples in long-term relationships (both long-enduring and expected to last into the future) do not want to use LARC methods because they anticipate the possibility of wanting a baby in the relatively near future (Higgins 2017). Similarly, social norms discourage pregnancy early within a new relationship, regardless of intimacy or commitment, and thus an "accidental" pregnancy may be less objectionable over time. Second, many contraceptive methods are difficult to continue for a long period, at least for some couples. Hormonal methods have side effects that women may tolerate less and less well over time (Littlejohn 2012) or that accumulate over time (e.g., weight gain) (Littlejohn 2013). Condoms and withdrawal interfere with sexual pleasure, which may become tiresome. Third, all non–long-acting contraceptive methods require a vigilance in terms of *consistency* that may be increasingly difficult to maintain over time, simply because of fatigue. Finally, financial costs of all these methods accumulate over time and may become less and less affordable or desirable. For these reasons, we expect duration itself to be an important predictor of contraceptive behaviors.

Of course, duration may capture aspects of intimacy or commitment that are not captured by whether a couple spends a lot of time together, commits to being monogamous, sleeps in the same bed, coresides at the same address, or plans to marry. For example, familiarity and comfort may accrue within a relationship in some ways that only come with time. It is impossible to rule out this potential measurement error.

Conflict and power imbalance are also linked to duration, in part because conflictual and power-imbalanced relationships likely dissolve more quickly than less conflictual and more balanced relationships. In relationships that persist, though, duration is associated with increasing disrespect and threats of violence (Kusunoki et al. 2010). In addition, those who reunite after a break-up experience more verbal abuse and physical violence (Halpern-Meekin et al. 2013a; Kusunoki et al. 2010) compared with couples who remained together continuously, and relative to levels of conflict before the breakup. Thus, it is important to assess whether conflict and power imbalance are associated with contraceptive behaviors beyond these links to duration.

A Note About Pregnancy Desire

Couples who want a pregnancy do not use contraception (Moreau et al. 2012). Underlying our and other researchers' hypotheses about intimate relationship dynamics and contraceptive use is the assumption of a steady lack of desire for pregnancy during the transition to adulthood. However, desire for pregnancy increases with intimacy/commitment and relationship duration (Barber et al. 2019; Weitzman et al. 2017). Thus, to separate

contraceptive behaviors from desire for pregnancy, our hypotheses and analyses focus only on couples when they do not want a pregnancy in the upcoming month.

Methods

Data

The RDSL study began with a representative, random, population-based sample of 1,003 young women residing in a Michigan county who were ages 18–19 at the time of the baseline interview and followed for 2.5 years such that the full range of ages represented in these data are 18–22 years old. The sampling frame was the Michigan Department of State driver's license and Personal Identification Card (PID) database.[5] Other demographic research has compared the RDSL sample with the NSFG's nationally representative sample of 18- and 19-year-old women (Ela and Budnick 2017), demonstrating that the RDSL sample is similar to the corresponding NSFG sample, with a few exceptions.[6]

The first component of data collection was a baseline face-to-face survey interview conducted between March 2008 and July 2009, assessing sociodemographic characteristics, attitudes, relationship characteristics and history, contraceptive use, and pregnancy history. At the conclusion of the baseline interview, respondents were invited to participate in weekly surveys for a 2.5-year follow-up period. The five-minute weekly phone or online surveys collected prospective measures of pregnancy desire; one-week retrospective assessments of relationship characteristics, such as sexual exclusivity, time spent together, sexual intercourse, and coresidence; and pregnancy and contraceptive use. This is one of the only data sets with multiple observations of the same relationships as they change over time. Although RDSL is geographically constrained, research using national samples has not hypothesized (or modeled) different effects by region, so it is consistent with other research to think that the processes we investigate here are likely generalizable across geographic contexts.

Respondents were paid $1 per weekly survey with $5 bonuses for on-time completion of five weekly surveys in a row. Of the 1,003 women who completed the baseline interview, 95% (953) participated in the weekly surveys. Although we refer to the period between surveys as one week, time between interviews varied from five days to nearly one year, with a mode of eight days. The questionnaire adjusted for longer intervals by referring to the *period* since the prior interview (by referencing "in the past <x> days" or "since <specific date>") if the prior interview was within two weeks, or to the prior week if it was more than two weeks ago. Only 9% of weekly interviews were completed two or more weeks after the prior weekly interview, which resulted in missing data.

[5]When choosing the RDSL sample, the sampling statisticians at the University of Michigan's Survey Research Center calculated that 95% of women ages 18–19 in the census were included in the sampling frame. We do not know the differences between women who were included in the sampling frame and those who were not, but we suspect that the excluded women are poorer and less stably housed than the included women. A driver's license costs $25 in Michigan. However, one must have a driver's license or personal ID card to receive public assistance in Michigan, and a personal ID card costs only $10. The fee is waived for those who receive public assistance or for other "good cause." Thus, the financial barrier is fairly low for obtaining an ID card.

[6]The RDSL women are slightly more religious, more likely to have a mother who gave birth as a teen, and more likely to have experienced a teen pregnancy themselves. However, the proportion of the sample that is Black in RDSL is nearly double the proportion of Black respondents in the NSFG sample, which likely at least partially explains these discrepancies. Also, a slightly smaller proportion of the RDSL young women had first sexual intercourse before age 17, relative to the NSFG respondents.

The follow-up component concluded in January 2012, resulting in 57,602 weekly interviews. Four-fifths (84%) of baseline survey respondents participated in the weekly surveys for at least 6 months, 79% participated for at least 12 months, and 75% participated for at least 18 months (for a fuller description of attrition in the RDSL study, see Barber et al. 2016).

We limit our analyses to young women who ever reported any intimate partnership during the study period and to those weeks when they were in such a relationship. We analyze contraceptive use only during weeks in which the respondent had heterosexual sexual intercourse, was not pregnant, and did not want to get pregnant.[7] We further exclude the longest 5% of relationships (all relationships that were already ongoing at the beginning of the study and lasted 3.99 years or longer) because so few relationships were observed at such long durations and including them would heavily influence coefficients for duration.[8]

The weekly survey specifically defined sex as “when a man puts his penis into a woman’s vagina.” In supplementary analyses of qualitative interviews with a subsample of nonheterosexual respondents, women indicated that they reported only heterosexual penetrative contact when answering this question (Ela and Budnick 2017). Therefore, the current study is one of contraceptive use during opposite-sex sexual encounters.

Measures

Contraceptive Use

Any contraceptive use.: In the weekly surveys, respondents were asked separate questions to assess non–coital-specific and coital-specific contraceptive use. Questions were designed to avoid the terms “birth control,” “protection,” and “contraception.” First, to assess noncoital methods, respondents were asked, “Did you use or do anything that can help people avoid becoming pregnant?” In order to include use for other purposes, (e.g., menstrual cycle regulation or acne reduction), the question included the clause, “even if you did not use it to keep from getting pregnant.” Response options included birth control pills, birth control patch, NuvaRing, Depo-Provera (or any other type of contraceptive injection), Implanon (or another contraceptive implant), or an IUD. For coital-specific contraception (in weeks when they reported heterosexual sexual intercourse), respondents were asked whether they used a condom, a diaphragm or cervical cap, spermicide, a female condom, and/or withdrawal. At each weekly interview, if women reported using *any* of these non–coital-specific or coital-specific methods, they are coded 1; if they reported none of these methods, they are coded 0.

Hormonal versus coital-specific contraception.: Our hypotheses mainly distinguish between methods in terms of whether they require advance planning or cooperation of a partner; whether they are a hassle at the time of intercourse; their overall effectiveness; and

[7] In other words, women who reported a desire for pregnancy at some point during the study are still included, but the *weeks* when they reported that desire are excluded from our analytic sample. In our main analyses, we define “want to get pregnant” (the excluded weeks) as those in which the woman gave a response of 5 to the question, “How much do you want to become pregnant in the upcoming month?,” where the response options were 0 (not at all) to 5 (extremely). We conducted sensitivity analyses with three additional definitions of wanting to get pregnant; see footnote 12.

[8] We also conducted sensitivity analyses including these 42 relationships, which are described in the Results section.

to some extent, whether they prevent STIs. Thus, for parsimony and because hormonal methods are similar in these respects, as are coital-specific methods (except STI prevention), we combine methods into two categories: hormonal methods and coital-specific methods. We use respondents' reports of the specific contraceptive method they used to identify whether they used a hormonal method (birth control pills, birth control patch, NuvaRing, Depo-Provera (or any other type of contraceptive injection), Implanon (or another contraceptive implant), IUD) or a coital-specific method (condom, a diaphragm or cervical cap, spermicide, a female condom, and/or withdrawal). Each week is coded to the *most effective* (for pregnancy prevention) method used that week. For example, a week with use of both birth control pills and a condom is coded as hormonal, and a week with use of both condoms and withdrawal is coded as condoms.

Consistency of coital-specific contraceptive use.: Consistency of contraceptive use is based on answers to the question, "In the past <days since last interview>, did you or your partner(s) use some method of birth control *every time* you had intercourse (even if you are not trying to prevent pregnancy)?" (emphasis added). Yes is coded 1 (consistent), and no is coded 0 (not consistent). Because hormonal method use does not vary with each specific act of intercourse within a short time period, we analyze consistency only when respondents reported condom use (without a hormonal method) or withdrawal (without condoms or a hormonal method). Consistency is applicable only for those who reported using condoms (without a hormonal method) or using only withdrawal. Consistent condom users used a condom or withdrawal every time they had intercourse during that week; inconsistent condom users sometimes used condoms (and perhaps withdrawal as well) and sometimes used no method. Consistent withdrawal users used withdrawal every time they had intercourse during that week; inconsistent withdrawal users sometimes used withdrawal and sometimes used no method.

Intimate Relationship Dynamics—Each week, a series of questions ascertained whether the respondent had a partner of any kind during the prior week. For a new (not discussed in a prior interview) partner, respondents provided initials or a nickname for use in the interview.[9] If the partner was different from the most recent interview but had been discussed in a prior interview, respondents chose from their list of initials/nicknames to link interviews about the same partner across time, regardless of breaks. The questions were designed to elicit the widest possible range of relationships that was meaningful to the respondent.

To measure *intimacy and commitment*, RDSL did not ask respondents to label their relationships but instead asked a series of questions. Respondents were first asked whether they were engaged to be married or married to their partner, whether they lived in a place "separate from where your partner lives," or how many nights they spent "all night sleeping in the same bed" during the prior week. Answers to these questions define the three most intimate/committed relationships: engaged/married, cohabiting (shared address), and *stayovers* (slept in the same bed at least three nights out of the prior seven; Jamison and

[9]In the 1% of weeks when a respondent had more than one partner, only the "most important or most serious" one was discussed in detail.

Ganong 2011). We combine *engaged* with *married*, and *cohabiting* with *stayover*, because these categories are conceptually similar and have similar associations with the dependent variables in our analyses. Two additional questions describe the remaining relationships: whether they "spent a lot of time" with their partner during the prior week (intimacy; Kusunoki and Upchurch 2011), and whether they had "agreed to only have a special romantic relationship with each other, and no one else" (commitment; Carter et al. 2013; Higgins et al. 2012; Hock-Long et al. 2012). We use three categories combining these measures: (1) committed dating; (2) uncommitted dating (spent a lot of time together but not committed); and (3) casual (did not spend a lot of time together and not committed; reference category). The final measure of intimacy/commitment includes five mutually exclusive categories.

Relationship duration indicates the total of all weeks with the current partner—including, in the case of breakup followed by reunification, any time spent together before and after breakups. Duration is coded in exact years (days divided by 365). We also include a squared term in the models. Because age and duration are positively correlated in the study's relatively short period of observation, we control for age. Age is obtained from the state-level driver's license and PID records used for sample selection. Although only 18- and 19-year-old women were chosen from these records, a small number reached age 20 before they were located for the baseline interview. Mean age was 19.17 years.

The RDSL data set includes six weekly indicators of *conflict and power imbalance*. We constructed a measure coded 1 for churning if the couple ever broke up and reconciled (Halpern-Meekin et al. 2013a, b). Partner-dominated decision making—assessed with the question, "Who decides what to do or where to go when you go out?"—is coded 1 for the partner, and 0 for respondent or both (Manning et al. 2009; Wildsmith et al. 2015). Four questions directly assessed conflict during the prior week, with responses to each coded 1 for yes and 0 for no: "Did you and ___ fight or have any arguments?" (fighting), "Did ____ swear at you, call you names, insult you, or treat you disrespectfully?" (disrespect), "Did ____ threaten you with violence?," and "Did ____ push you, hit you, or throw something at you that could hurt?" (threats of physical assault or physical assault) (Manning et al. 2009; Wildsmith et al. 2015). If a respondent was nonmonogamous (i.e., had sex with someone outside the dyad) or thought her partner was nonmonogamous, nonmonogamous is coded 1 (Hock-Long et al. 2012).

Control Variables

Stable Partner Characteristics—RDSL includes two additional indicators of power imbalance, but because they do not vary over time within a relationship and thus are not our main focus in this article, they are included as control variables. First, we code age difference between the partners in exact years by subtracting the respondent's exact age from the partner's reported age (Kusunoki and Upchurch 2011; Manlove et al. 2011, 2014; Manning et al. 2009). Second, we compare women's educational attainment with their partner's education at the beginning of their relationships to create a three-category measure of educational asymmetry: respondent had more education, both had equal education, or partner had more education (Manlove et al. 2011; Manning et al. 2009; Wildsmith et al.

2015). Partner's education was reported categorically, but we convert the categories to years: dropped out of high school (11), graduated from high school but not enrolled in postsecondary education (12), enrolled in postsecondary education (14), and graduated from a four-year university (16).

Finally, because young parents have a high rate of subsequent pregnancy (Boardman et al. 2006), and 82% of postpartum women use some form of contraception but vary whether they chose highly effective, effective, or the least-effective methods (Guzzo et al. 2018), we control for the couple's childbirth history: couple has a birth together, woman has a birth with a prior partner, partner has a prior birth, and neither has a prior birth (reference category).

Demographics and Socioeconomic Characteristics—Race is measured with the following question: "Which of the following groups describe your racial background? Please select one or more groups: American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, Black or African American, or White." If a respondent reported more than one race, she was asked which race best describes her. Because the RDSL sample is predominantly White or African American, race was dichotomized into Black versus non-Black. For the question, "How important if at all is your religious faith to you?," response choices ranged from 1 (not at all important) to 4 (more important than anything else), which we reduce to two categories: not at all or somewhat important versus very important or more important than anything else (i.e., highly religious). In the baseline interview, women were asked whether they were currently receiving public assistance from any of the following sources: Women, Infants and Children Program (WIC), Family Independence Program (Michigan's Temporary Aid to Needy Families program), cash welfare, or food stamps. If they answered yes to any source, they are coded 1 for receiving public assistance. We include public assistance as a marker of socioeconomic status and because those receiving public assistance may have access to family planning services at a lower cost. Many respondents were still enrolled in high school, and few had completed any postsecondary education at the time of the baseline interview. Therefore, we use high school GPA as an indicator of educational success and future potential.

Family Background—We use four dichotomous indicators to control for experiences during childhood that may affect intimate relationship experiences *and* contraceptive use: family received public assistance (during childhood), biological mother had her first birth as a teenager, mother's education was less than high school, and grew up with one biological parent only (no stepparent) or with extended family members.[10]

Adolescent Experiences Related to Sex and Pregnancy—Finally, we include measures of adolescent experiences to control for the effects of early sexual behavior and contraceptive use on later contraceptive use. We use four dichotomous measures, based on the baseline interviews: age at first sex less than 17; more than two sex partners; ever had sex without contraception; and one or more prior pregnancies.

[10]A sensitivity analysis replacing this with an indicator of not growing up in a family with two biological parents (i.e., including a stepparent) is described in the Results section.

One additional variable—*total number of weekly interviews*—controls for repeated assessments and attrition.

Analytic Strategy

We begin by describing the sample using proportions and means. We then describe contraceptive use and relationship characteristics of the sample. Next, we use within-between (W-B) (hybrid) logistic regression methods to model our dichotomous dependent variables, using the command *xthybrid* in Stata (Allison 2009; Dieleman and Templin 2014; Schunck and Perales 2017). This method embeds a fixed-effects estimator within a random-effects (mixed model) framework. It provides fixed effects for within-relationship (week-level) variables, but unlike fixed-effects models, it also allows for the inclusion of a random intercept. Separate coefficients are estimated for the relationship-level mean (between-relationship differences) and the deviations from that mean (within-relationship differences). In addition, the model allows us to include random-effects for time-invariant characteristics of the women, considered control variables in our models. Because the coefficients for the between-relationship differences reflect both the within-relationship *and* between-relationship effects (Dieleman and Templin 2014), we do not present or interpret those coefficients in the tables (available from authors by request).

As in fixed-effects models, the coefficients in the fixed-effects part of the W-B model (within-relationship coefficients) are net of selection processes related to the relationship-level differences (differences across each relationship's average). In other words, these models control for the effects of all unmeasured and/or omitted relationship-level and woman-level characteristics on contraceptive use that are stable by comparing contraceptive use in some weeks within a relationship with contraceptive use in other weeks within the same relationship.

We present four models: (1) whether the couple used any contraceptive method; (2) whether contraceptive users relied on a hormonal method versus a coital-specific method; (3) whether couples using condoms (without a hormonal method) used a condom every time they had sex in that week; and (4) whether couples using withdrawal (without another method) did so every time they had sex in that week.

The unit of analysis for all models is the person-week: coefficients estimate the additive effect on the log odds of the specific contraceptive behavior in each week in the analytic sample. For example, a positive coefficient indicates higher log odds (which translates to higher odds and higher probability) of using contraception in that week relative to other weeks within the same relationship that are coded 0 for that variable.

Results

Sample Characteristics

Table 1 presents the characteristics of our analytic sample of 720 ever-partnered women from the RDSL study. The average age at the time of the baseline interview was 19.17 years (range = 18.12–20.31, SD = .57). In all, 33% of women reported their race as Black. Slightly more than one-half (54%) of women said that religion was very important or more important

than anything else (high religious importance). More than one-quarter (27%) of women reported receiving public assistance at the time of the baseline interview. The average high school GPA was 3.11 (range = 0–4.17, SD = .61). More than one-third (37%) of women reported that their family received public assistance during childhood or that their mother was a teen when she had her first child. Less than one-tenth (9%) of women's mothers had less than a high school degree. Almost one-half (48%) of women reported growing up in some other family arrangement. Almost two-thirds (60%) of women reported they were younger than 17 at first sexual intercourse, and 71% reported two or more sexual partners by the baseline interview. More than one-half (56.0%) of women reported that as of the baseline interview, they had had sexual intercourse without some method of birth control. For prior pregnancies, 27% of women reported one or more as of the baseline interview.

Contraceptive Use

Table 2 presents descriptive statistics for contraceptive use in our analytic sample. The vast majority of women (90%) used a contraceptive method at some point. They used contraception in 91% of their intimate relationships and 89% of the time during the study period. Nearly one-half (48%) of contraceptive users ever used a hormonal method; 45% of intimate relationships that ever used contraception included some hormonal method use; and when women were using contraception, it was a hormonal method 58% of the time.

When using condoms, women used them with their partner every time they had intercourse (consistently) 61% of the time, on average. Across all relationships, the mean level of consistency was 62% of the time. And, across all weeks, condom use was consistent 68% of the time. Withdrawal use was much less consistent. When women and their partners relied on withdrawal, they were consistent only 25% of the time; across all relationships, they were consistent 22% of the time; and across all weeks, withdrawal was used consistently only 28% of the time.

Relationship Dynamics

Table 2 also presents a summary of the relationship dynamics in the analytic sample. The first column indicates the proportion of the 720 women who ever experienced each relationship type, and the proportion of women who ever experienced each indicator of conflict/power imbalance. The second column indicates the proportion of the 1,557 intimate relationships that were ever in each type (e.g., proportion ever cohabiting), their mean duration, the proportion that ever included each indicator of conflict/power imbalance, and the mean (continuous variables) or proportion (dichotomous variables) for the stable partner characteristics. The third column shows the proportion of weeks in the analytic sample that were coded 1 for each variable (i.e., the overall proportion of time in each relationship type, the mean amount of time (in weeks) after a relationship included conflict/power imbalance). Overall, the relationship-level statistics are similar to those at the woman level because 80% of women had only one or two relationships during the study period, as reflected by the generally larger percentages for women than for relationships. The majority (60%) had one relationship, 20% had two relationships, and 20% had three or more relationships (not shown in tables). The maximum was seven relationships (not shown in tables). The week-

level means are even smaller because, for example, even if many women and/or many relationships were *ever* in each type, the *proportion* of time spent in each type is smaller.

With the exception of engagement/marriage, which was less common at these ages, at least one-half of the women experienced each type of relationship at least once. The most commonly experienced type was uncommitted dating (spending time together but without a commitment to being monogamous). Overall, women spent substantial time in each type of relationship: approximately equal time (~20%) in engagement/marriage, cohabiting/stayover, and committed dating relationships; 29% of their time in uncommitted dating; and 11% with casual partners. Note that the proportions for women and relationships do not sum to 100% because women experienced multiple relationships, and most relationships were classified as different types at different time points. However, the week-level numbers sum to 100% because they represent the proportion of weeks in each type across all weeks.

Across all relationships, the mean duration was 0.98 years. This is an underestimate, however, because many relationships were ongoing at the end of the study period (i.e., right-censored).

Women experienced a substantial amount of conflict and power imbalance in their relationships. About one-half experienced a breakup followed by reconciliation; 25% ever experienced partner-dominated decision-making; 91% experienced fighting; 53%, disrespect; 22%, threats and/or physical assault; and 33%, nonmonogamous behavior. These indicators of conflict and power imbalance were less common at the relationship level than woman level. For example, only 30% of the relationships broke up and reconciled, only 13% ever included partner-dominated decision-making, and 59% including fighting. One-fifth (21%) of the relationships included nonmonogamous behavior. Thus, although many women had these experiences in one relationship, they did not have them in all of their relationships.

Recall that the weekly varying indicators of conflict and power imbalance are coded as “switches” that turn on if and when the relationship includes the specific experience; as a result, the mean represents the total proportion of the time across all intimate relationships that occurred after each experience. Thus, 4% of observations were post-reconciliation in a relationship that broke up, 14% were after a partner dominated decision-making, 76% were after a first fight, 38% were after disrespect, 15% were after a relationship became violent (threats and/or physical assault), and 14% were after experiencing nonmonogamous behavior. These experiences occurred in a much lower proportion of weeks, however (not shown in tables); only 3% of observations included partner-dominated decision-making, 26% included fighting, 11% included disrespect, 3% included threats and/or physical assault, and 2% included nonmonogamous behavior. Thus, each of these experiences was relatively rare, but young women spent substantial time in relationships after they included those experiences.

Stable partner characteristics that suggest power imbalance were also prevalent, with an average age difference of 2.46 years and 42% of partners having more education than the woman herself. The majority (67%) of relationships did not have a prior birth, and only 12%

had a shared birth. Only 14% of women entered relationships with a child from a prior partner, and only 8% of relationships were with a man who had a child with a prior partner.

Intimate Relationship Dynamics and Contraceptive Use

Table 3 presents W-B logistic regression models of any contraceptive use among women who did not want a pregnancy[11] and of the use of hormonal versus coital-specific methods among contraceptive users.

The within-relationship estimates for relationship dynamics in column 1 show that couples are less likely to use contraception while their relationship is more intimate and committed —engaged/married, cohabiting/stayover, committed dating, and uncommitted dating—than when it is casual. The model also shows that contraceptive use declines as relationships endure.[12] The squared term indicates that the rate of decline slows and that contraceptive use would eventually increase.[13] Note that decreasing contraceptive use within a relationship is net of any simultaneous increase in intimacy or commitment. Additionally, recall that these models do not include times when women want to get pregnant, so declining contraceptive use as relationships endure and become more intimate and committed is likely not because couples are trying to become pregnant. Aging is associated with a simultaneous increase in contraceptive use, which offsets some of the decline.

This model also shows that conflict and power imbalance, overall, are not as consistently related to overall use of any contraception. There is one exception: after experiencing partner-dominated decision-making, couples are less likely to use contraception than they were before that experience.

The control variables in this model (random effects) show that women with older/less educated partners, with prior children, with lower high school GPA, who are receiving public assistance, and who ever had sex without contraception during adolescence have lower overall rates of contraceptive use.[14]

The second column shows that couples who do use contraception are increasingly likely to use hormonal methods rather than coital methods as their relationships endure.[15] The

[11]Recall that we define “want a pregnancy” as giving a response of 5 (on a scale from 0 to 5) to the question, “How much do you want to get pregnant during the next month?” We reestimated our models three times, using three alternative definitions of wanting a pregnancy: (1) any nonzero response to the question about desire for pregnancy, (2) anything but the strongest antinatalism (a response of 0 for desire to get pregnant and 5 for a parallel question about wanting to avoid pregnancy), and (3) a response of 0 for desire to avoid pregnancy. Sensitivity analyses with these three sample restrictions produced very similar results. Coefficients that differed from those presented in Tables 2 and 3 are as follows: coefficients for engaged/married → any contraceptive were sometimes not statistically significant (although the p values increase to only ~ .13), cohabiting/stayover → hormonal versus coital method were marginally insignificant in one model ($p = .08$), cohabiting/stayover → withdrawal consistency and fighting → withdrawal consistency were significant with two of the three alternative specifications of pregnancy desire. These differences do not change our substantive conclusions.

[12]Recall that we exclude the 42 (5%) longest relationships. Sensitivity analyses including them produced very similar results, with one exception: the coefficients for duration and duration squared predicting withdrawal consistency. Rather than −0.17 (nonsignificant) and −0.03 (nonsignificant), respectively, they became 1.56 (significant at $p < .01$) and −0.09 (nonsignificant). Thus, the 42 longest relationships were particularly consistent in their use of withdrawal.

[13]The equation indicates that this increase would occur around four years, but few relationships in RDSL were observed at the four-year point. Our models should not be interpreted beyond the duration of the study (2.5 years).

[14]A sensitivity test replacing “did not grow up with two parents” with “did not grow up with two biological parents” produced results that were very similar in magnitude and statistical significance to the models shown in Tables 2 and 3.

squared term indicates that the rate of increase slows and would eventually decrease.[16] Aging again offsets some of this effect of duration.

Conflict and power imbalance are more associated with the use of hormonal rather than coital-specific methods among contraceptive users in this model than with overall levels of contraceptive use in the prior model. Women are more likely to use hormonal methods after a relationship involves partner-dominated decision-making or fighting than they were before those experiences. On the other hand, after a relationship includes nonmonogamy (behavior), women are less likely to use hormonal methods than they were before the nonmonogamy occurred.

The random-effects models show that higher education, adolescent (pre-study) births, non-Black race, success in high school, and less disadvantaged family background are associated with hormonal rather than coital-specific contraceptive use. However, some aspects of early sexual experience (early sexual debut and multiple adolescent sex partners) predict more hormonal method use, and others (having adolescent sex without birth control and an adolescent pregnancy) predict more coital method use.

Table 4 presents models of consistency of coital-specific method use during the times when couples are using coital-specific methods. The first model focuses on the consistency of condom use (when couples are using condoms but not any hormonal method), and the second model focuses on the consistency of withdrawal (when couples are using withdrawal only, no condoms or hormonal methods).

Overall, very few aspects of relationship dynamics predict the consistency with which couples use condoms. The one exception is duration: as intimate relationships endure, couples who continue to use condoms do so less and less consistently.

The control variables (random effects) show that women with better educated partners and higher high school GPA are more consistent condom users. Those who are more sexually experienced (had a prior birth, had more than two sexual partners during adolescence, and/or had sex without contraception as an adolescent) are less consistent condom users.

The second model indicates that intimacy/commitment and conflict/power imbalance are better predictors of consistency when couples are relying on withdrawal than when they are using condoms. Couples are particularly inconsistent with withdrawal while they are cohabiting or staying over, relative to when they are casual. Withdrawal consistency also decreases as the relationship endures, although not significantly so. Finally, among those couples relying on withdrawal to prevent pregnancy, this method is particularly inconsistent after fighting, threats and/or physical assault, or nonmonogamous behavior within the relationship.

[15]Alternatively, coital method use may appear to decline over time because couples shift from using only coital methods to using dual methods (coital and hormonal methods)—that is, they continue using coital methods but become increasingly likely to add a hormonal method—which would appear as shifting from coital to hormonal methods in our coding scheme. To test this, we estimated models of coital method use *without* a hormonal method separately from coital method use *with* a hormonal method. Both types of coital method use declined over time.

[16]The equation indicates that this decrease would occur around three years, but few relationships in the RDSL were observed at the three-year point. Our models should not be interpreted beyond the duration of the study (2.5 years).

In terms of the random effects for the control variables, women with better educated partners use withdrawal more consistently, and highly religious women and those who had sex without contraception during adolescence use withdrawal less consistently.

Discussion

Our analyses demonstrate that changing intimacy/commitment, conflict/power imbalance, and duration are independently associated with changes in contraceptive behaviors within the same relationship. These associations are net of any stable individual-level tendencies toward contraception that may also affect women's relationship behaviors during young emerging adulthood and net of any stable link between a specific couple's unmeasured relationship characteristics and its contraceptive use. This is because the "within" effects in our within-between models directly assess change by comparing a relationship with itself at different points in time. This way of isolating the effects of relationship characteristics on contraceptive behaviors, made possible by new data with repeated observations of the same relationship over time, strongly suggests a causal link between the characteristics of intimate relationships and contraceptive use.

We find that couples who want to avoid pregnancy are less likely to use any type of contraception when they are intimate and committed compared with that same couple's contraceptive use when they are less intimate and committed. This is consistent with the first cross-sectional pattern in prior research, but we also demonstrate that this link between increasing intimacy and commitment and decreasing contraceptive use is net of the strong tendency for a couple's contraceptive use to decline with relationship duration regardless of whether they become more intimate/committed. This is consistent with the idea that a couple's tolerance of an undesired pregnancy may increase over time and/or may be higher when they are more intimate and committed (Barber et al. 2019).

Our analyses are partially inconsistent with the second cross-sectional pattern demonstrated by prior research—namely, that long-term serious couples are more likely to use hormonal contraception and less likely to use condoms than short-term casual couples (Manlove et al. 2011). Our analyses are particularly inconsistent with the interpretation of that cross-sectional pattern as indicating that couples switch from condoms to hormonal methods when their relationships become more serious (i.e., intimate and committed). We show that although couples who continue to use contraception become increasingly likely to use hormonal methods over time (i.e., with duration), this occurs regardless of the level of intimacy and commitment.

That intimacy and commitment do not affect method choice net of change over time is *not* consistent with the idea prevalent in existing research that couples stop using condoms when their relationship becomes serious because their fears of contracting an STI decrease in parallel. In our models, condom use is *not* lower when a couple commits to being monogamous relative to when they do not. Although young men and women may have less fear of contracting an STI in a committed relationship, condom use declines as the relationship endures regardless of whether it becomes committed.

That couples become increasingly likely to choose hormonal rather than coital contraceptive methods as their relationship endures points toward the differences between hormonal and coital methods as potential explanations. Hormonal methods are more effective and do not interfere directly with sexual pleasure. If the couples who continue to use contraception as their relationships endure become increasingly selective of those who are most strongly motivated to prevent pregnancy, it makes sense that those who continue to use contraception would choose more effective (hormonal) methods to prevent pregnancy. In addition, the effect of duration on decreasing condom use is consistent with a fatigue effect, where increasing sexual frequency in more intimate relationships and heightening concerns with sexual pleasure make it increasingly difficult to maintain condom use for a long time (Higgins and Smith 2016; Ott et al. 2002; Sangi-Haghpeykar et al. 2006; Sayegh et al. 2006).

However, the link between monogamy and condom use is complex. Our analyses suggest that condom use is more consistent with behavioral effects (nonmonogamous behavior), rather than commitment effects, on STI risk perception. The link is inconsistent, however, with the idea that women with nonmonogamous partners especially want to prevent pregnancy because they are not using the hormonal methods (with or without condoms) that are more effective at doing so. Further research should disentangle the links among commitment to monogamy, actual monogamy, changing attitudes toward STI risk, and condom use.

We also find that among coital contraceptive users, higher levels of intimacy and commitment are largely not associated with the consistency with which couples use condoms or withdrawal. On the other hand, consistency of condom use decreases as a relationship endures, regardless of whether it is intimate or committed. This is also consistent with the fatigue effect described earlier: it becomes increasingly difficult or unpleasant to maintain coital method use over time.

The third major pattern demonstrated by cross-sectional research—that conflictual and/or power-imbalanced couples are less consistent condom users—and the corresponding implication that condom use is less consistent during periods of conflict or power imbalance are not supported by our models. Instead, we find that couples who use condoms use them about as consistently while they are experiencing conflict and/or power imbalance as when they are not experiencing conflict and/or power imbalance. Thus, cross-sectional differences in condom consistency may be more about the type of couples who are inconsistent condom users—with couples having more conflict and power imbalance tending to always be inconsistent condom users—and less about conflict and power imbalance, per se, causing inconsistent condom use. We also examine consistency among withdrawal users, something that previous research has not investigated; we find that in contrast to condom users, withdrawal users are less consistent when they are experiencing conflict and/or power imbalance relative to when their relationship is more harmonious and/or balanced.

That conflict and power imbalance affect consistency of withdrawal use but not condom use points toward their differences as an explanation. Withdrawal is less expensive and readily available at all times (and thus should be *easier* to use consistently, not harder) compared

with condoms, suggesting that perhaps those who rely on withdrawal (without condoms) are less committed to preventing pregnancy than condom users. Withdrawal and condoms also affect sexual pleasure in different ways, and perhaps men or women tire of the consequences of withdrawal more quickly than the consequences of condoms. Further research should explore the differences between condom and withdrawal users as well as the differences in how well those methods are used, both topics that have been largely neglected.

Previous research has focused almost exclusively on the link between conflict and/or power imbalance and consistency of condom use but has largely neglected the link between conflict and/or power imbalance and other aspects of contraceptive behavior (for an important exception, see Manlove 2011). We show that, on average, a couple is less likely to use any contraception when they are experiencing conflict and/or power imbalance (relative to when they are more harmonious and/or balanced), but that couples who continue to use contraception during those times tend to use hormonal rather than coital methods. One key difference between hormonal and coital methods is that coital methods require the full cooperation of the male partner, whereas women can implement hormonal methods on their own, clandestinely if necessary. Building on other research demonstrating that women in violent or coercive relationships who want to use contraception expect to have less control over whether they have sex and whether they use contraception (Kusunoki and Barber 2019) and that men in violent relationships tend to want their girlfriends pregnant and use reproductive coercion to implement that desire (Barber et al. 2018), our analyses are consistent with the idea that women in these conflictual and/or power-imbalanced relationships who continue to use contraception require a clandestine method to do so (Kusunoki et al. 2018).

Limitations

Although the RDSL sample was randomly selected and population-based, it is representative of young women in a single county in Michigan, which decreases the overall generalizability of the results. The county has only a small number of Latinas; we hope that our research motivates future studies on populations that include more Latinas. However, in terms of cohabitation, marriage, age at first birth, completed family size, nonmarital childbearing, and teenage childbearing, Michigan is not an outlier (Lesthaeghe and Neidert 2006). Using a sample from a constrained geographic area has the advantage of minimizing variations in aspects of the social context that are not our main interest in these analyses. For example, local religious landscape or unemployment could influence both intimate relationships and contraceptive use. We do not, however, expect the underlying causal processes that we examine here to vary across regions.

Another limitation of the RDSL study is that it did not interview male partners and thus lacks information from the partners' point of view. This is important for our understanding of contraceptive decisions, particularly for male-controlled methods. For example, it is unclear whether condom use declines over time because women grow tired of their use, because men grow tired of their use, or both. However, male partners in some types of relationships would be difficult to interview—for example, very casual relationships, or violent relationships—and RDSL's decision *not* to ask women for contact information for

such partners probably facilitated the inclusion of a broad range of relationships and may have maximized women's reports of those partners for whom they would not have provided contact information. Relatedly, RDSL collected intimate partner violence (IPV) victimization data from women but not from their partners. Although IPV is perpetrated by both men and women, gender-based violence against women remains more prevalent and harmful, and the non–injury-related burden (such as undesired pregnancy) is suffered by women (Reed et al. 2010).

Finally, several limitations in the scope of the article preclude a comprehensive story about intimate relationships and contraceptive use. The combination of a broad range of hormonal methods into a single category and, likewise, the consideration of condoms and withdrawal as a single category are simplifications that future research should address. Although hormonal methods share many similarities—for example, they require a visit with a clinician (in Michigan and most other states), and they are more expensive for women without health insurance—there are many distinctions that may shape choices among them. The same is true for condoms and withdrawal. In addition, we have not considered dual method use: the combination of a hormonal method and a condom. Condoms are the only method currently available for STI prevention and thus merit an in-depth treatment of their own. Relatedly, older couple's contraceptive behaviors differ substantially from younger couple's behaviors, particularly in terms of the distribution across these different methods, and our analyses represent only younger couples' behavior.

Conclusion

We provide the first evidence that contraceptive use changes over time within the same relationship. We add to the evidence that duration is a predictor of whether a couple uses contraception (Manlove et al. 2007, 2011), but we expand that evidence by disentangling the effects of duration from the effects of increasing intimacy and commitment. Further, in our models, duration is the most powerful and consistent determinant of contraceptive behaviors, suggesting that couples' contraceptive behaviors change over time regardless of other changes in their relationships. We interpret this pattern as consistent with the continued vigilance required for long-term contraceptive use of the most commonly used methods (oral contraceptives, condoms, and withdrawal) during these young ages. It is also consistent with duration as a proxy for other important but unmeasured (in our models) aspects of intimate relationships.

Theoretically, increasing duration and increasing intimacy/commitment are often conflated, perhaps because it has been difficult to disentangle them empirically. However, it is unlikely that all, or perhaps even most, relationships linearly increase in intimacy and commitment as they endure. Given the importance of the intimate relationship as the social context of decision-making at these ages, future research should focus on disentangling these concepts. For example, increasing duration may not imply an increasing devotion toward staying together in the future or an increasing commitment to monogamy. Each of the mechanisms that we posit—for example, tolerance of an undesired pregnancy, perceived STI risk, desire for clandestine use, tolerance of side effects—may be affected differently by duration, intimacy, and commitment.

Our analyses further illuminate the well-established pattern that about one-half of undesired pregnancies occur to couples who were using contraception but were not using it consistently (Guttmacher Institute 2018; Henshaw 2009; Jones et al. 2012; Martinez et al. 2011; Scott et al. 2011). It is difficult for young couples to maintain the vigilance required to prevent pregnancy. Although LARC methods are commonly used by older couples, younger couples tend not to use these methods, in part because what makes them unique—their long-term horizon—is particularly unappealing to those who want to have a baby in the future but are unsure about when (Higgins 2017). In addition, clinicians were reluctant in the past, and perhaps are still so, to recommend LARC methods for young and/or childless women (Ihongbe and Masho 2018). To reduce undesired pregnancy during these ages—the period with the highest rates of undesired pregnancy—it will be necessary to develop new contraceptive methods that are perceived as less long-term than LARC methods, or to encourage the use of existing LARC methods by somehow changing perceptions about their suitability for short-term use or making them easier to discontinue without the assistance of a clinician.

We show that women in relationships dominated by partner decision-making (who do not want a pregnancy) use less contraception, but those who are able to continue using contraception tend to use female-controlled hormonal methods. We do not know much about the young women with dominant male partners who, in the face of that dominance, are able to use hormonal contraception and prevent undesired pregnancy, even though ideas about intimate relationships as the site of pregnancy coercion and contraceptive sabotage have been in the research literature since at least the 1990s (Campbell et al. 1995; de Bocanegra et al. 2010; Jones et al. 2016; Miller et al. 2010b; Miller et al. 2007). Recent demographic research has begun empirically and theoretically addressing reproductive autonomy as well (Coleman-Minahan et al. 2018; Dehlendorf et al. 2018; Kost and Zolna 2019; Potter et al. 2014) but has focused largely on structural barriers, such as characteristics of clinics or providers or the cost of contraception. The intimate relationship as a facilitator, barrier, or simply an important social context deserves further demographic attention in our focus on this important issue. Future research should also focus not just on reproductive autonomy but also on young women's autonomy more generally. For example, women in partner-dominated or violent relationships may also be less able to implement their desires for educational attainment, career success, or other important life domains.

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Data Availability

Barber, J. S., Kusunoki, Y., & Gatny, H. H. (2015). *Relationship Dynamics and Social Life Study*. Ann Arbor, MI: ICPSR. Available from https://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34626

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Table 1

Sample description (n = 720 women), RDSL data set (2008–2012)

	Proportion/Mean	SD	Min.	Max.
Age (at baseline interview)	19.17	.57	18.12	20.31
Demographics and Socioeconomic Characteristics				
Black	.33	*a*	0	1
Highly religious	.54	*a*	0	1
Receiving public assistance	.27	*a*	0	1
High school GPA	3.11	.61	.00	4.17
Family Background				
Received public assistance	.37	*a*	0	1
Mother had first birth as a teen	.37	*a*	0	1
Mother's education less than high school	.09	*a*	0	1
Did not grow up with two parents	.48	*a*	0	1
Adolescent Experiences Related to Pregnancy				
Age at first sex <17	.60	*a*	0	1
More than two sexual partners	.71	*a*	0	1
Ever had sex without contraception	.56	*a*	0	1
Prior pregnancy	.27	*a*	0	1
Total Number of Weekly Interviews	60.36	40.49	2.00	146.00

[a]Dichotomous variable.

Table 2

Proportion/mean for measures of intimate relationship dynamics and contraceptive behaviors

	Ever/Never or Mean for Women (n = 720)	Ever/Never or Mean for Relationships (n = 1,557)	Yes/No or Mean for Weeks (n = 15,609)
Contraceptive Use			
Used any contraceptive method	.90	.91	.89
Hormonal method use (while using any method)[a]	.48	.45	.58
Consistency of coital method use			
Consistent condom use[b]	.61	.62	.68
Consistent withdrawal[c]	.25	.22	.28
Intimate Relationship Dynamics			
Intimacy and commitment			
Relationship type			
Engaged/married	.34	.16	.20
Cohabiting/stayover	.50	.25	.21
Committed dating	.57	.34	.19
Uncommitted dating	.81	.56	.29
Casual	.69	.61	.11
Duration (in years)	—	.98	—
Conflict and power imbalance			
Churning (ever broke up and reconciled)	.51	.30	.04
Partner-dominated decision-making	.25	.13	.14
Fighting	.91	.59	.76
Disrespect	.53	.29	.38
Threats/physical assault	.22	.11	.15
Nonmonogamous	.33	.21	.14
Control Variables			
Stable partner characteristics			
Age difference, in years	—	2.46	—
Partner's education, in years	—	12.41	—
Education difference			
Partner has equal education		.41	
Partner has more education	—	.42	—
Partner has less education	—	.17	—
Couple's childbirth history			
Couple has birth together (shared)	—	.12	—
Woman had birth with prior partner	—	.14	—
Partner had prior birth	—	.08	—
Neither has prior birth	—	.67	—

[a] Among the 701 women and 1,481 relationships who reported a hormonal or coital method, and 13,794 weeks with any contraceptive use.

[b] Among the 473 women and 815 relationships that ever used condoms, and 3,523 weeks of condom use.

[c] Among the 370 women and 561 relationships that ever used withdrawal (without condoms), and 2,827 weeks of withdrawal use.

Table 3

Within-between logistic regression models of any contraceptive use, and hormonal versus coital method among contraceptive users, among women who do not want pregnancy, by intimate relationship characteristics and control variables (coefficients, with standard errors in parentheses)

	Any Contraceptive Use vs. No Use (while sexually active)			Hormonal Method Use vs. Coital Method Use (while using any method)		
Within-Relationship Estimates (relationship dynamics)						
Intimacy and commitment						
Relationship type (ref. = casual)						
Engaged/married	−0.81	(0.30)	**	−0.12	(0.24)	
Cohabiting/ stayover	−0.65	(0.25)	**	0.33	(0.20)	
Committed dating	−1.27	(0.24)	***	0.21	(0.18)	
Uncommitted dating	−0.90	(0.24)	***	0.18	(0.18)	
Duration (in years)	−3.34	(0.58)	***	2.27	(0.48)	***
Duration squared	0.43	(0.06)	***	−0.36	(0.05)	***
Age (time-varying), in years	1.42	(0.52)	**	−1.23	(0.44)	**
Conflict and power imbalance						
Churning (ever broke up and reconciled)	−0.29	(0.20)		0.07	(0.17)	
Partner-dominated decision-making	−0.80	(0.22)	***	0.82	(0.19)	***
Fighting	−0.16	(0.21)		0.42	(0.14)	**
Disrespect	0.01	(0.18)		−0.23	(0.15)	
Threats/physical assault	0.16	(0.18)		−0.07	(0.19)	
Nonmonogamous	−0.31	(0.23)		−0.61	(0.21)	**
Control Variables (random effects)						
Stable partner characteristics						
Age difference, in years	−0.10	(0.03)	***	0.02	(0.04)	
Partner's education, in years	0.36	(0.13)	**	0.23	(0.14)	
Education difference (ref. = equal)						
Partner has more education	0.78	(0.27)	**	0.38	(0.26)	
Partner has less education	0.34	(0.35)		−0.80	(0.36)	*
Couple's childbirth history (ref. = neither has prio birth)						
Couple has birth together (shared)	−1.41	(0.40)	***	1.62	(0.54)	**
Woman had birth with prior partner	−1.22	(0.44)	**	3.17	(0.55)	***
Partner had prior birth	−1.38	(0.38)	***	−0.08	(0.42)	
Demographics and socioeconomic characteristics						
Black	−0.11	(0.29)		−1.36	(0.32)	***
Highly religious	−0.20	(0.26)		−0.11	(0.26)	
Receiving public assistance	0.30	(0.32)		−0.41	(0.36)	
High school GPA	1.01	(0.20)	***	1.08	(0.22)	***
Family background						

Received public assistance	−0.86	(0.25)	***	−0.26	(0.27)	
Mother had first birth as a teen	0.34	(0.25)		−0.75	(0.26)	**
Mother's education less than high school	−0.38	(0.39)		−1.03	(0.48)	*
Did not grow up with two parents	−0.04	(0.26)		−1.04	(0.26)	***
	Any Contraceptive Use vs. No Use (while sexually active)			Hormonal Method Use vs. Coital Method Use (while using any method)		
Adolescent experiences related to pregnancy						
Age at first sex <17	0.16	(0.30)		1.87	(0.31)	***
More than two sexual partners	0.09	(0.33)		1.34	(0.33)	***
Ever had sex without contraception	−1.01	(0.29)	***	−2.86	(0.31)	***
Prior pregnancy	−0.23	(0.34)		−1.09	(0.40)	**
Total number of weekly interviews	−0.012	(0.004)	***	0.004	(0.003)	
N (weekly interviews)	15,609			13,794		
N (relationships)	1,557			1,481		
Chi-Square	346.16			320.42		

* $p < .05$

** $p < .01$

*** $p < .001$

Table 4

Within-between logistic regression models of consistency among coital contraceptive users, among women who do not want a pregnancy, by intimate relationship characteristics and control variables (coefficients, with standard errors in parentheses)

	Consistent vs. Inconsistent Condom Use (while using condoms only)			Consistent vs. Inconsistent Withdrawal Use (while using withdrawal only)		
Within-Relationship Estimates (fixed effects)						
Intimacy and commitment						
Relationship type (ref. = casual)						
Engaged/married	−0.36	(0.45)		−0.58	(0.53)	
Cohabiting/stayover	0.15	(0.37)		−0.96	(0.41)	*
Committed dating	−0.44	(0.29)		−0.60	(0.34)	
Uncommitted dating	0.002	(0.28)		−0.35	(0.33)	
Duration (in years)	0.28	(0.74)		−0.17	(1.08)	
Duration squared	−0.34	(0.10)	***	−0.03	(0.10)	
Age (time-varying, in years)	0.60	(0.64)		0.69	(1.00)	
Conflict and power imbalance						
Churning	0.06	(0.30)		0.18	(0.42)	
Partner-dominated decision-making	−0.34	(0.44)		−0.42	(0.42)	
Fighting	−0.37	(0.24)		−0.55	(0.27)	*
Disrespect	0.33	(0.28)		0.06	(0.31)	
Threats/physical assault	−0.18	(0.41)		−1.20	(0.51)	*
Nonmonogamous	−0.33	(0.31)		−1.57	(0.49)	***
Control Variables (random effects)						
Stable partner/couple characteristics						
Age difference, in years	−0.04	(0.03)		0.01	(0.04)	
Partner's education, in years	0.41	(0.11)	***	0.28	(0.14)	*
Education difference (ref. = equal)						
Partner has more education	0.06	(0.23)		0.57	(0.28)	*
Partner has less education	0.19	(0.30)		0.31	(0.39)	
Childbirth history of the couple (ref. = neither has prior birth)						
Couple has prior birth together (shared)	−0.49	(0.42)		−0.83	(0.50)	
Woman had birth with prior partner	−1.36	(0.44)	**	0.47	(0.59)	
Partner had prior birth	−0.59	(0.35)		−0.90	(0.49)	
Demographics and socioeconomic characteristics						
Black	0.06	(0.26)		−0.46	(0.33)	
Highly religious	0.12	(0.22)		−0.73	(0.27)	**
Receiving public assistance	0.50	(0.30)		0.18	(0.42)	
High school GPA	0.70	(0.18)	***	−0.38	(0.27)	
Family background						
Received public assistance	−0.13	(0.22)		0.41	(0.32)	

Mother had a teen mother	0.01	(0.22)		−0.14	(0.28)	
Mother's education less than high school	0.01	(0.36)		0.34	(0.59)	
Did not grow up with two parents	0.12	(0.22)		0.16	(0.30)	
	Consistent vs. Inconsistent Condom Use (while using condoms only)			Consistent vs. Inconsistent Withdrawal Use (while using withdrawal only)		
Adolescent experiences related to pregnancy						
Age at first sex <17	0.09	(0.25)		−0.32	(0.31)	
More than two sexual partners	−0.64	(0.27)	*	−0.19	(0.34)	
Ever had sex without contraception	−0.78	(0.24)	***	−0.62	(0.29)	*
Prior pregnancy	0.31	(0.31)		−0.05	(0.46)	
Total number of weekly interviews	0.001	(0.003)		0.001	(0.004)	
N (weekly interviews)	3,523			2,827		
N (relationships)	815			561		
Chi-Square	141.18			98.80		

* p < .05

** p < .01

*** p < .001