Waiting to Have Sex: The Timing of First Sexual Intercourse

within Young People's Relationships

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ABSTRACT

This study examines the *timing of sexual intercourse within relationships* of young people in Kenya. In contrast to sexual debut, which is a single event in the lifetime, the decision if and when to have sex occurs repeatedly across youth's multiple partnerships. We use unique life history calendar data from a sample of urban youth to address two aims. First, we calculate the median time to first intercourse by parity of the relationship and find that later relationships have shorter durations to first sex. Second, we use event history techniques to examine the importance of the relationship context and previous relationship experience on the timing of sexual initiation within partnerships. We find that (1) commitment and power differences within relationships matter in different ways for males and females and (2) previous relationship experience affects the timing to sexual intercourse in subsequent relationships in the same direction for males and females.

INTRODUCTION

Researchers have a longstanding interest in the timing of sexual debut, and there is a large and growing literature on the determinants of early sexual initiation and its linkages to poor sexual and reproductive health outcomes (e.g., Harrison et al. 2005; Kabiru et al. 2010; Madise, Zulu, and Ciera 2007; Pettifor et al. 2004; Stone and Ingham 2002). By design, investigations of sexual debut focus on decision-making in individuals' first sexual partnership. However, many adolescents and young adults are involved in more than one relationship and therefore negotiations surrounding if and when to engage in sexual intercourse are not limited to the first event, but occur repeatedly across the early life course. Surprisingly, there has been no systematic investigation to date of the *timing of sexual intercourse within relationships* and what factors delay or speed the onset of sex across individuals' multiple partnerships. Similar to research findings on the delay of sexual debut in the lifetime, postponement of sexual intercourse within relationships could decrease exposure to disease and provide the opportunity for adolescents to be mentally and emotionally prepared for and make informed choices about sexual intercourse, including the use of condoms and contraceptives (Manlove, Ryan, and Franzetta 2003; Ryan et al. 2007; Smith and Udry 1985; Upadhyay, Hindin, and Gultiano 2006). Therefore, research is needed on the dynamics of sexual initiation within relationships as an important and previously overlooked aspect of sexual and reproductive behavior. Furthermore, to the extent that adolescents and young adults are likely to engage in multiple sexual relationships, a crucial question is whether previous experiences with sexual intercourse affect the progression to sexual initiation in later relationships as would be predicted by the life course theory.

Lack of research attention to the timing of sexual intercourse within relationships is partly due to conceptual and methodological constraints. Many surveys of adolescents and young adults collect information on the date of sexual debut as a single event in an individual's lifetime but neglect to consider the relationship context in which it occurs (e.g., Agha, Hutchinson, and Kusanthan 2006; Guo and Tong 2006; Upchurch et al. 1999). Sexual behavior is not solely determined by one individual but stems from the interaction of both partners' characteristics and expectations. For example, important relationship dimensions, such as the level of commitment or resource asymmetries between partners, could be key factors in the decision if and when to have sexual intercourse (Manlove, Ryan, and Franzetta 2007). Men and women often disagree about the timing of sexual intercourse in heterosexual relationships, and the developmental trajectories of sexual relationships are partly determined by the differentials in and exchange of power, status, and other resources between partners (Cohen and Shotland 1996; Sassler and Joyner 2011; Sprecher 1998; Sprecher and Felmlee 1997). Relationship context also plays an important role in shaping other sexual behavior such as contraceptive use among youth (Kusunoki and Upchurch 2011). Therefore, a complete picture of adolescents' sexual activities cannot be drawn without situating them in specific relationship contexts. Surveys that have gathered such relationship-specific information often focus on a snapshot of individual's cumulative partnerships, for example the "main" or most recent relationship, assuming that young people are only involved with one partner or the context of decision-making can be gleaned through information on a single relationship (Luke 2003). Informed by life course theory, recent surveys, such as the National Longitudinal Study of Adolescent Health (Add Health), recognize that context and behavior vary across individuals' multiple relationships, and they have pioneered methods to gather *relationship histories* from young people for several years

before the survey. Nevertheless, these studies tend to collect summary information on each relationship, such as ever having sex or overall consistency of contraceptive use throughout the relationship (Manlove et al. 2007). Few, if any, surveys are designed to gather information on relationship dimensions and behaviors as they change over time *within* each relationship and therefore it is impossible to estimate both the waiting time to sex across multiple relationships as well as its time-varying correlates.

The few studies that have situated the timing of sexual intercourse within the relationship context are subject to analytical flaws. In particular, analyses of progression of sexual activities in only the most recent relationships (Cohen and Shotland 1996; Rosengard et al. 2004) or multiple relationships experienced by the same persons (Cleveland 2003; Fortenberry et al. 2002) are likely to bias the estimates of the effects of various relationship characteristics. This is because potential event dependence—the notion that progression to sex in a current relationship may be delayed or accelerated depending on prior relationships—is ignored (Box-Steffensmeier and Jones 2004).

This paper employs life course theory and methods to examine the influence of the relationship context and previous sexual relationship experience on the timing of sexual initiation within partnerships of youth in urban Kenya. Adolescent sexual activity is of particular concern in settings such as sub-Sahara Africa, where youth are severely affected by HIV/AIDS and other STDs as well as early pregnancy and abortion (Buvé et al. 2001; Glynn et al. 2001). We analyze data collected from a random sample of young males and females ages 18-24 using an innovative life history calendar, the Relationship History Calendar (RHC). The RHC data contain detailed retrospective relationship histories for each respondent, including time-varying individual, partner, and relationship characteristics and behaviors for 10 years before the survey. In addition, contrary to most surveys of youth in sub-Saharan Africa, which focus and collect information on sexual partnerships only, RHC relationship histories include information on the occurrence and timing of sexual intercourse within all types of relationships, including those where youth did not engage in sex (Clark, Kabiru, and Mathur 2010).

Our analysis has two main aims. First, we describe the timing of sexual intercourse by parity of the relationship to investigate how such timing varies as respondents' gain additional relationship experience. Second, we adopt a conditional gap time model that adjusts for within-individual correlation due to repeated events to examine the importance of the relationship context in terms of dimensions of commitment and resource asymmetries between partners on the timing of sexual intercourse. We also investigate how the number, type, and time to sex in previous relationships affect the timing of sexual initiation across subsequent relationships. Given that access to resources, motivations for relationships, and previous sexual experience may differ for young males and females in sub-Saharan Africa, most of our analyses explore differences in the timing and determinants of sexual intercourse within relationships separately by sex.

CONCEPTUAL FRAMEWORK

Life course theory focuses on the sequence and timing of life events and the contexts in which important transitions take place (Elder 1994; Elder 1998). It emphasizes that individual behavior is embedded in and shaped by a larger social and historical context that goes beyond personal characteristics. It also predicts that individuals' decision-making and behaviors are informed by

their previous experiences and hence the timing of a life event is contingent on the timing and experiences of earlier events. Our interest is in exploring the timing of sexual intercourse within relationships of young people, and our conceptual framework builds on the idea that the progression to sexual intercourse is not solely determined by one individual but stems from the interaction of both partners' expectations and resources. In particular, we investigate the role of the relationship context in terms of commitment and resource asymmetries between partners as well as individuals' past sexual experiences.

Commitment within Relationships

Level of commitment to a relationship or degree of closeness between two partners has been associated with adolescent sexual debut in previous research. A high level of commitment to a relationship could raise adolescents' expectation for physical intimacy as an expression of love and commitment, which may in turn shorten the time period before first sexual intercourse (Upadhyay et al. 2006). For example, previous studies using Add Health data have found that involvement in a romantic relationship and emotional commitment are related to an increased likelihood of initiating sexual intercourse in an adolescent's lifetime (Bearman and Brückner 2001), and that this association may be more apparent among young males (McNeely et al. 2002). Research in Mali found that rural female adolescents tended to have sex earlier than they would have liked because of a marital duty or the promise of marriage, while in urban areas, those who expressed that they were in love with their partners had sex earlier (Gueye, Castle, and Konaté 2001).

In contrast, a high level of commitment could enhance the quality of partner communication about everyday life as well as sexual behavior. Previous research has revealed that open and supportive partner communication plays an important role in facilitating sexual negotiation and decision-making within a relationship and hence results in positive reproductive health outcomes, such as contraceptive use at first sexual intercourse among young men and women (Manlove et al. 2007; Stone and Ingham 2002). Strong commitment to a relationship also enhances the couple's persistence in seeking appropriate solutions to various problems they encounter (Tallman 2003). Thus, higher levels of commitment could be associated with waiting longer to initiate sex within the relationship.

The level of commitment within a relationship has also been measured in terms of exclusivity and if either partner is involved in other, concurrent partnerships. A partner's concurrency may increase an individual's perception of elevated risk of STI infection (Norris and Ford 1999) and change his or her attachment to the relationship and thus postpone the progression to sexual intercourse (Brady et al. 2009). A young person's own involvement in a concurrent relationship may signal his or her own decreased commitment and thus delay increased intimacy, including the progression to sexual intercourse. These findings lead us to hypothesize that a higher level of commitment within a partnership—characterized by serious types of relationships and feelings of love—will be associated with earlier onset of intercourse within the relationship. In addition, we hypothesize that a young person's and his or her partner's involvement in concurrent relationships will be associated with postponed progression to sexual intercourse within the relationship.

Other research has uncovered motivations beyond commitment that may accelerate the onset of sexual intercourse within relationships. Research in the U.S. has found that the desire to engage in intercourse as well as physical attraction reduced the waiting time for first intercourse of male and female adolescents (Cleveland 2003; Cohen and Shotland 1996). Therefore, we hypothesize that motivations based on physical satisfaction will be associated with earlier onset of sexual intercourse as well.

Resource Asymmetries between Partners

Sexual activities, like other decisions negotiated between couples, are dependent not only on the characteristics of two individuals in the match but also on power differentials between them. Resource asymmetries imply dissimilarities between partners in socioeconomic status, level of maturity, or ability to negotiate relationship outcomes (Ford, Sohn, and Lepkowski 2002; Kaestle, Morisky, and Wiley 2002; Stein et al. 2008), which in turn create an imbalanced power distribution (Abma, Driscoll, and Moore 1998; Kusunoki and Upchurch 2011; Weisman et al. 1991). The individual with access to greater resources will have more influence on important decisions, including when to initiate sex within the relationship (Malhotra and Mather 1997; Agarwal, 1997; McElroy, 1990; Kabeer, 1997; Luke, Goldberg, Mberu, & Zule 2011). The underlying assumption in most studies of adolescent sexual behavior, including sub-Saharan Africa, is that males prefer to have sexual intercourse earlier, while females desire not to have sex or delay its initiation, given the greater expectations of virginity, consequences stemming from unintended pregnancy, and associated stigma (Luke 2006; Harrison 2008; Remien et al. 2009). Therefore, males with greater power within the relationship will negotiate for earlier sexual intercourse, while females with greater power will seek to delay sex within the relationship.

In previous studies of sexual behavior, resource asymmetries and power differentials have largely been measured by age differences between partners (Abma, Driscoll, and Moore 1998, Luke 2003, Kaestle et al. 2002); however, educational and economic status asymmetries also denote differences in knowledge, status, and access to resources (Beegle, Frankenberg, and Thomas 2001; Luke 2003). Thus, we hypothesize that females' relationships with older, relatively more educated, and wealthy male partners will be associated with earlier initiation of sexual intercourse, and males' relationships with older, relatively more educated, and wealthy female partners will be associated with delayed onset of sexual intercourse.

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In the context of sub-Saharan Africa, the exchange of money and gifts within relationships (often referred to as "transactional sex") has been identified as another source of power differentials. Numerous studies have found that large amounts of money and gifts (what we refer to as "transfers") are given by males to their female partners and are a motivation to engage in sexual relatinships; to a lesser extent, females also give transfers to males (Dunkle et al. 2007; Luke 2003; Luke 2006; Luke et al. 2011; Moore, Biddlecom, and Zulu 2007). While the giving and receiving of transfers in young people's relationships may purely be signs of affection and unrelated to sexual activity (Luke 2006), many believe that the desire for status, luxuries, or survival that motivate many young women to accept transfers place them at a disadvantage relative to their partners (Kaufman and Stavrou 2004; Leclerc-Madlala 2008; Luke 2003). Several studies have found associations between the receipt of transfers by young women and increased sexual activity and decreased condom use (Luke 2006; Luke et al. 2011) and increased risk of HIV infection (Dunkle et al. 2004). We test the hypotheses that being motivated to be in the relationship because of money and gifts as well as receipt of larger amounts of transfers lead to more rapid progression to sexual intercourse within relationships for females. For young males, larger amounts given to female partners would accelerate the progression to intercourse within their relationships while being motivated by money and gifts would delay in the onset of sexual intercourse.

Relationship History

A life course approach also recognizes that early life experiences affect later behavior and outcomes (Elder 1994; Elder 1998; Manlove et al. 2007). Adolescents and young adults who are sexually experienced may view sexual activity more positively (Menning, Holtzman, and Kapinus 2007) and hence may initiate sex earlier in subsequent relationships. One study found that having sex for the first time changed adolescents' attitudes toward sex to be more permissive, which itself predicted a higher likelihood of sexual intercourse (Meier 2003). Another study using Add Health data found that those with prior nonsexual "dating" relationships had sexual intercourse earlier in their lifetimes than those with less dating experience (Bearman and Brückner 2001); in this case, prior nonsexual relationship experience facilitated sexual activity. These results together suggest that any type of previous relationship—sexual or otherwise—may accelerate the transition to intercourse in subsequent partnerships. The effect of previous relationship experience not only has substantive importance for relationship outcomes, but such "event dependence" has implications for modeling the timing to first sex within multiple sequential and concurrent partnerships.

Individual Characteristics

Several individual characteristics are included in the analyses. Older ages are associated with more knowledge and experience and therefore may speed the onset of sexual activity within relationships for males and females. With respect to socioeconomic status, school enrollment has been identified as protective for adolescents against sexual risk (Hallman and Grant 2004; Lloyd and Hewett 2003), and we hypothesize enrollment will delay the onset of sexual intercourse for both sexes. Finally, employment status can increase young people's financial independence and decision-making power within relationships (Hallman and Grant 2004; Luke

et al. 2011), which we hypothesize would result in delayed intercourse for females and accelerated for males.

DATA AND METHODS

The Relationship History Calendar

This paper draws on life history data collected using an innovative survey instrument called the "Relationship Histories Calendar" (RHC). The RHC is a modification of life history calendars, which have been successfully used in other studies to gather highly accurate retrospective information on contraception use, births, migration, schooling, and employment (Axinn, Pearce, and Ghimire 1999; Belli 1998). Similar to many life history calendars, the RHC gathers retrospective information on monthly changes in employment and schooling (Freedman, Thornton, Camburn, Alwin, and Young-DeMarco 1988). In addition, the RHC was specifically designed to capture the dynamic processes of youths' sexual and nonsexual relationship histories. Respondents provided detailed information about each of their partnerships over the last 10 years, including their partners' demographic characteristics, relationship dimensions (including type, reasons for entering and continuing in the relationship, and exchanges of money and gifts between partners), and sexual behaviors in each relationship (Luke, Clark, and Zulu 2011). Ethical approval for the study was granted by all collaborating institutions.

The sample was drawn by contacting every other household in 45 randomly selected urban enumeration areas. Men and women ages 18 to 24 in the selected households were eligible to be interviewed; one eligible respondent was chosen randomly from each household. In order to assess the quality of sexual behavior reporting, selected respondents were randomly assigned to be interviewed with the RHC or a more standard demographic survey. A comparison of reporting by each type of survey instrument found that the RHC decreased social desirability bias and improved reporting on multiple measures of sensitive sexual behaviors in comparison to the standard survey (Luke, Clark, and Zulu 2011).

The RHC sample includes 608 respondents. We exclude 18 adolescents (3.0 percent) who had not established a sexual or nonsexual relationship in the last 10 years, resulting in 313 male and 277 female respondents (total N=590).

Dependent Variable

A relationship episode is defined as an uninterrupted sequence of months in which a respondent reported being in a relationship with a specific partner. A new relationship episode began each time a partner change occurred, even if the partner had been identified in an earlier episode (Fortenberry et al. 2002). The dependent variable in this study is the "failure time," measured in months, from the start of a relationship to the month of first sexual intercourse with that partner within that relationship episode.

An episode was censored if sexual intercourse did not occur throughout the course of a relationship. No additional failure time was contributed by a relationship episode after the occurrence of first sexual intercourse with that partner. That is, we only analyze the failure time

to first sexual intercourse within a partnership. All episodes were censored at the time of survey if they were still ongoing.

Young males and females with one partner contributed one episode unless that partnership was broken and resumed, in which case, two episodes were contributed. Only 11 adolescents in our sample experienced such a scenario. During the time frame of the 10 years before the survey, a respondent could have had multiple relationships and hence contributed multiple episodes. We stratify multiple relationship episodes per individual according to the temporal order of their initiations. We limit our regression analysis to the first four episodes for each respondent, because only very few young men and women (N=72) in the sample had more than four episodes, and few of them experienced sexual intercourse within those episodes.[1]

Independent Variables

We examine the effects of individual and relationship characteristics and previous relationship experience on the timing of first sexual intercourse across partnerships. All variables are time-varying and thus can change values across months in the calendar.

At the individual level, age in years is measured as a continuous variable, and we include a squared term to test for nonlinearity. Dichotomous variables include school enrollment and employment status in the current month.

Commitment to a relationship is measured in several ways. After extensive pre-testing, the main categories of relationships in Kisumu were determined to be, in order of seriousness: spouses, fiancés/fiancées, serious relationships, dating relationships, casual relationships, and less common partnership types like commercial sex or one-night stands. Because several categories contained few observations, we created a four-category variable: spouses/fiancés/fiancées, serious, dating, and casual/other. For each relationship-month, the RHC also recorded respondents' main and secondary reasons for being in the relationship. "Love," "physical attraction," and "sex" were among the response categories, and we construct separate dichotomous variables for whether respondents reported each of these as the main or secondary reason for being in the relationship or not. Finally, two dichotomous measures of exclusivity or concurrency were constructed; one, whether the respondent knew or believed the partner to have other marital or nonmarital sexual partner(s) or not and two, whether the respondent had other sexual or nonsexual partner(s) during the month.

Resource asymmetries between respondents and their partners are measured by several variables. The age difference between partners was constructed as a continuous variable for the partner's age minus the respondent's age. Highest level of education was recorded for both partners in each relationship-month (none, primary, secondary, some college or more), and we created a trichotomous variable designating if the partner had a lower level, higher level, or same level as the respondent. The partner's economic status is measured as what the respondent *perceived* to be his or her status (low or medium vs. high) for each relationship-month. Though subjective, we consider this to be an appropriate measure of those aspects of the partner's economic status that might influence the respondent's behavior. Finally, we include two measures of

[1] Only 23.7% of 103 fifth and higher-order episodes involved sexual intercourse.

transactional sex. First, respondents were asked to estimate the value of money, gifts, and material assistance received from each partner in each relationship-month, as well as a separate estimate of the value of transfers they gave to each partner. We create one variable indicating the net amount of money or gifts received (amount received minus amount given). Second, we include a dichotomous variable for whether the respondent reported "money, gifts, or assistance" as a main or secondary reason for being in the relationship.

With respect to the respondents' relationship history, we construct several variables to capture previous experience. We include separate variables for the cumulative number of sexual and nonsexual partners for each month to capture the intensity of previous experience with these types of relationships. We also construct a variable designating the proportion of all previous relationships to date that were sexual in order to measure the degree of experience that included sexual activity. Finally, in order to examine whether the timing to sex in previous relationships affects the time to sex in later relationships, we construct a categorical variable indicating no sex occurred in the previous relationship or if sex occurred 1-3 months, 4-6, 7-12, or more than 12 months from the onset of the previous relationship.

Analytic Methods

Our analyses include both descriptive and multivariate regression analyses that utilize event history techniques, which are appropriate for analyzing time to event in the presence of censored data. We utilize information on the number and type of relationships that respondents had in the 10 years before the survey.[2] We differentiate between sexual and nonsexual relationships. A relationship is defined as sexual if at least one act of sexual intercourse occurred in any month within the relationship. A relationship is defined as nonsexual if no acts of sexual intercourse were reported throughout the relationship.

In the first part of the analysis, we describe the timing of sexual intercourse by parity of the relationship to investigate how such timing varies as respondents' gain additional relationship experience. We calculate Kaplan-Meier (KM) estimates of median time to first sexual intercourse within relationships by relationship parity. We use log-rank tests to detect potential event dependence between multiple relationship episodes experienced by the same respondents. Specifically, the log-rank test examines whether the average time to first sexual intercourse within relationships differs significantly by relationship parity. We perform the test separately for respondents who experienced one, two, three, four, and five or more relationships in the last 10 years.

In the second part of the analysis, we fit regression models to examine associations between individual-level variables, measures of relationship commitment and resource asymmetries, and previous sexual experience and the timing to first sexual intercourse within partnerships. Multiple relationship episodes and occurrences of first sexual intercourse within these episodes may introduce interdependence between recurrent events that an individual experienced. Sexual or nonsexual experience obtained from previous relationships is likely to affect the progression to intercourse in later relationships. Ignoring this can lead to biased regression estimates and improper statistical inference (Aalen 1992). We adopt a conditional gap time model to

[2] In the sample, only 10.3% of respondents commenced sexual activity prior to the 10-year reference period.

accommodate the correlation between recurrent first sexual intercourse events that an individual experienced in multiple relationship episodes (Box-Steffensmeier and Jones 2004). In this model, we assume that there is a natural sequence of recurrent events and that an individual was not at risk for a later event until he or she experienced all prior events. This implies that a respondent only became at risk of having first sexual intercourse within the *k*th relationship episode after he or she had been exposed to the risk within the *k*th-1 episode. We can estimate a conditional gap time model by extending the conventional Cox model to clustering on individuals and stratifying by event order (Box-Steffensmeier and Jones 2004).

We fit another set of regression models to further investigate the effects of previous relationship history on timing to first sexual intercourse within later relationships. As in the first regression analysis, we include two variables indicating the number of sexual and nonsexual previous relationships in the model. To further explore the influence of previous relationship history, we run additional models that replace these variables with variables for the proportion of previous partnerships that were sexual and the timing to first intercourse in previous relationships. For this second set of regressions models, we must drop first relationship episodes for each individual, as no previous relationship history is available for these first episodes. This also means that respondents who had only one relationship in last 10 years are excluded.

RESULTS

Sample Characteristics

In Table 1, we describe the young males and females in the sample at the baseline (i.e., the first month of their first relationship) in last 10 years. Both males and females entered their first relationship (whether sexual or nonsexual) during this time period at age 15. Approximately two thirds of females were enrolled in school and only six percent were employed; the figures on school enrollment and employment for males are 79 percent and 13 percent, respectively.

With respect to commitment within the first month of first relationships, the modal category was dating relationships for both sexes, followed by casual/other partnerships; very few relationships (five percent for females and four percent for males) began as married or promised to be married. Among females, 32 percent reported they initiated the relationship because of love, and over one quarter expressed the main or secondary reason for the relationship was due to physical attraction or sex. For males, 23 percent reported love was a main reason and a majority (61 percent) reported physical attraction or sex. Less than two percent of respondents maintained a concurrent partner at this time; however, approximately 14 percent reported that their partners had other partner(s).

Regarding measures of resource asymmetries, male partners were five years older than female respondents on average, which echoes findings from other studies of adolescent girls in sub-Saharan Africa (Luke 2003). For male respondents, female partners were 1.3 years *older* than them on average, suggesting that young males tend to enter into relationships in adolescence and early adulthood with women their same age or slightly older. Most respondents (approximately 60 percent) had the same level of education as their partners, but a larger percentage of females (35 percent) than males (14 percent) had partners with a higher level of education. Fifteen percent of females and 22 percent of males reported their partners were wealthy. The net mean amount in money and gifts received from partners during the first month of first relationships

was Kenyan shillings (Ksh) 574 (US$8.00; 70 Ksh per US$1 at the time of the survey) for young women. Young men gave Ksh 54 more than they received on average. Over 15 percent of females initiated the relationship because of money or gifts, while only three percent of males reported this as a main reason.

Timing of Sexual Intercourse by Relationship Parity

Table 3 presents the Kaplan-Meier estimates of the median time in months to first sexual intercourse by relationship parity for those individuals who had one, two, three, four, or five or more relationships in the last 10 years. We pool males and females in this sample in order to increase samples sizes for those who had four and five or more relationships.[3] In addition, we should note that both sexual and nonsexual relationships are included in this analysis.

First, it is important to point out that a great majority of individuals had more than one relationship in the last 10 years; 80 percent (472 out of 590 individuals) had more than one.[4] Log rank tests are used to examine the significant difference in failure time among low- and higher-order relationship episodes. Across all parities, the duration to first sex is longest for the first relationship, and as respondents have more relationships, the median failure times drop relatively rapidly. Log-rank tests indicate that significant differences in waiting time by relationship parity only exist for those who had three relationships in total as well as across all individuals' relationships.[5] These findings suggest that both the number of previous relationships and time to sexual intercourse within them may affect the onset of sexual intercourse in later relationships.

Regression Results

Table 4 shows parameter estimates of the time to sexual intercourse within relationships from conditional gap time models. Looking first at the results for females, we see that age has a significant association with accelerated time to sexual intercourse within relationships but at a slightly decreasing rate given the significance of the squared term. School enrollment delays the onset of sexual intercourse within relationships (marginally significant).

Consistent with our expectations, relationship commitment influences the timing of sex for females. Those who had dating or casual/other partners are more likely to delay sexual intercourse than those who had serious partners, while there is no significant difference between spouse/fiancée and serious partners. In addition, those who were in the relationship for love are significantly more likely to initiate sex than those not motivated by love. One variable related to resource asymmetries shows a significant association with the timing of first sex within

[3] The results for males and females separately show similar patterns as the pooled sample and are available from the authors upon request.
[4] Recall that the small percentage of respondents who reported no sexual or nonsexual relationships in the last 10 years is dropped from the analysis.
[5] The log-rank tests show significant differences in time to first intercourse by relationship parity for a combined sample of all respondents. This indicates the presence of event dependence that reflects the effects of early partnership experience on later sexual activity and hence will be taken into account through the use of the conditional gap time model in the regression analysis.

relationships for females. Being in the relationship for money/gifts/assistance accelerates the timing of first sex compared to those who were not motivated in this way.

Finally, the number of previous sexual and nonsexual partners is significantly associated with the timing to first intercourse within relationships, but in different directions by type of relationship. Each additional nonsexual experience delays the progression to sex, while each additional sexual partner speeds the transition to sex substantially. Thus, for females, these results support the view that commitment to a relationship, lower decision-making power within it, and previous sexual experiences hasten the time to first sex, while previous experiences with nonsexual relationships increase the waiting time to sex within relationships.

For young males, none of the individual-level characteristics or variables related to relationship commitment is significant. With respect to resource asymmetries, there is a marginally significant association between age differences and time to sex within relationships. Larger age differences (where the female partner is older than the respondent) are associated with a delay in the onset of first sex, indicating that less power for young males on this dimension slows down the progression to first sex, as expected. Finally, similar to females, the number of previous sexual and nonsexual partners is significantly associated with the timing to first intercourse within relationships and in opposite directions, where nonsexual experience delays first sex in subsequent relationships and sexual experience speeds the onset of sex. Thus, for males, relationship commitment and resource asymmetries appear to have little influence on the timing to sex within relationships, however previous relationship experiences are important drivers of this timing.

Table 5 presents results of the time to sexual intercourse within relationships from conditional gap time models that include additional variables measuring previous relationship experiences. For this analysis, we limit our sample to relationship episodes beyond the first for each respondent, and thus the results refer to associations and dynamics occurring in these higher-order relationships only. Model 1 in Table 5 includes the same variables as Table 4. We replace the variables for relationship history in Models 2 and 3 sequentially in order to avoid collinearity and to investigate how different aspects of previous relationship experience are related to timing to first sex within relationships.

Looking across the results for individual characteristics for females, we find that both school enrollment and employment significantly decrease the risk of first sexual intercourse within relationships (the significant results for employment are marginal). Numerous variables measuring relationship commitment are significant and are in the expected directions. Young females in less committed dating and casual/other relationships progress to first sex more slowly than those in serious relationships, while there is no significant difference between spouse/fiancé and serious relationships. Females who maintain a concurrent partner delay sexual intercourse within their relationships compared to those without an additional partner, and those who were in the relationship for love progress to sexual intercourse more rapidly than those not motivated by this feeling of commitment.

The results relating to resource asymmetries are also quite important in explaining the timing of sexual intercourse within relationships for females and in the expected directions. Females involved with partners of higher educational status than their own progress to sexual intercourse more quickly, and this is a significant result. Both measures of transactional sex are generally

significantly associated with the timing to first sex across models. Young women motivated by money/gifts/assistance to be in the relationships are more likely to initiate intercourse compared to those who were not motivated in this way. Furthermore, larger net positive amounts of money and gifts received from partners also significantly speed the progression to first sex within relationships.

Finally, all variables for previous relationship experiences are significantly associated with the timing to first sex for females. Similar to the results in Table 4, the number of previous sexual and nonsexual partners both significantly affect the timing to first intercourse within relationships and in opposite directions (Model 1). Nonsexual experiences delay the timing to first sex and additional sexual experiences accelerate the onset of sex. In addition, the larger the proportion of previous relationships that were sexual, the more rapid is the onset of sex in subsequent relationships (Model 2). With respect to the timing of sex in the previous relationship, those who had sex quite quickly—one to three months after the relationship began—progressed to sexual intercourse more rapidly in the subsequent relationship than those who waited to have sex four to six months, the reference category (Model 3). This result mirrors the findings from Table 2, which show that median waiting times to sex decrease as the parity of the relationship increases. The onset of sexual intercourse is delayed if the respondent and partner did not have sex at all in the previous relationship compared to the reference category. There are no significant differences between the reference category and longer waiting times to sex in the previous relationship.

Looking across the results of the three models for young males, several individual characteristics are significantly associated with the timing of first sex within relationships. Age (marginally significant) and school enrollment have negative effects on this timing, while being employed speeds the progression to first sex. With respect to relationship commitment, males in relationships with casual/other partners proceed to first sex significantly more rapidly than those in serious relationships, which is reverse to the result for females. In addition, those who express physical attraction or sex as the main reasons for the relationship also proceed to first sex significantly faster than those who are not motivated in this way. There are no significant effects for variables measuring resource asymmetries for males.

In Table 5, all variables for previous relationship experiences are significantly associated with the timing to first sex for males and in the same directions as females. Higher numbers of nonsexual experiences delay and additional sexual experiences accelerate the onset of sex within relationships (Model 1), and the proportion of previous relationships that were sexual is positively associated with the progression to first sex (Model 2). Results for the timing of sex in the previous relationship also show that the onset of sexual intercourse is delayed if the previous relationship was nonsexual, and those who had sex one to three months after the relationship began progressed to sexual intercourse more rapidly in subsequent relationship than the reference category, those who waited to have sex four to six months (Model 3). There are no significant differences between the reference category and longer waiting times to sex in the previous relationship.

Finally, a comparison of the results from Table 4, which include all relationship episodes, and Model 1 in Table 5, which excludes first relationship episodes, finds that the results generally do not change appreciably in terms of the magnitude of most variables. The exception is having concurrent sexual partner(s) for females, which changes direction and becomes significant in

Table 5. This indicates that for the sample of female respondents with two or more relationships in the last 10 years, having a concurrent partner significantly reduces the time to first sex. This effect was perhaps dampened in Table 4 when first relationship episodes were included, as these were associated with many young females who only had one relationship in the last 10 years and thus could not have had concurrent partnerships.

DISCUSSION AND CONCLUSION

This paper examined the timing to first sexual intercourse within young people's relationships in urban Kenya. Much of the previous research on adolescent sexual activity examines the timing of sexual debut within individuals' lifetimes, which focuses on the first sexual relationship only. Instead, we explored the timing of first sexual intercourse across individuals' multiple partnerships. Using unique life history calendar data collected from a random sample of young people in Kisumu, Kenya, we considered two aspects of the relationship context—commitment and resource asymmetries—as well as dimensions of previous relationship experiences as important factors that influence the waiting time to sex within relationships.

In the first part of our analysis, we showed that the great majority of young people in this urban Kenyan setting have multiple relationships in the period of adolescence and young adulthood. Given the major focus on youth sexual activity and sexual partnerships in sub-Saharan Africa stemming from the HIV/AIDS epidemic, it is important to note that the life history calendar data contain details on nonsexual relationships as well, which is one of the few surveys to do so. Engagement in multiple relationships underscores the fact that young people must negotiate whether and when to have sex repeatedly during the transition to adulthood and that time to first sexual intercourse within relationships is an important new area of research.

We next calculated the median time to first sex in months by relationship parity and showed that earlier relationships had longer durations to first sex than later ones. This may be due to increased romantic and sexual experience that is accumulated within earlier relationships, resulting in, for example, increased positive attitudes toward engaging in sexual intercourse with future partners (Menning, Holtzman, and Kapinus 2007). Thus, the number and type (sexual vs. nonsexual) of previous relationships, as well as timing to first sex within them, could be significant predictors of the waiting time to sex in subsequent relationships.

To test these assumptions as well as explore how the context of relationships affects timing to sexual intercourse, we estimated conditional gap time models in the second part of our analysis. We found that the context of the relationship matters and in different ways for young males and females. In line with our expectations, relationship commitment speeds up the time to first sex for females. For males, however, commitment appears to slow the progression to sex within the relationship. For example, we found that, compared to serious relationships, casual relationships transition to first sex earlier for males, while females wait longer to have sex with casual partners. It may be the case that males delay sexual intercourse with more serious partners as a sign of love and respect for them, as has been found in Nigeria (Izugbara 2007). In addition, different motivations to be in the relationship shorten the waiting time to sex for males and females. Males who are in relationships due to physical attraction or sex transition faster to first sex, while females who are in relationships for love transition faster. Taken together, these

results suggest that stronger commitment or attachment to a relationship tends to speed up the timing to first sexual intercourse for young females but postpones it for young males.

With respect to resource asymmetries, consistent with our expectations, the less power young women possess in relationships, the more quickly sexual intercourse is initiated within them. This is particularly true for relationships involving transactional sex. When females receive larger amounts of money and gifts from their partners or are in the relationship for this reason, the time to sexual intercourse is accelerated. While we equate receipt of material transfers from male partners as lessened decision-making power for females, money and gifts could also be perceived by young females as signs of love and commitment from male partners (Poulin 2007; Samuelsen 2006; Luke et al. 2011), which also result in more rapid progression to sexual intercourse. Interpretations of transactional sex in sub-Saharan Africa are complex, and the exchange of money and gifts can have both affective and transactional elements (Hunter 2007). Nevertheless, being motivated to be in a relationship due to money or gifts most likely reflects power asymmetries and how they play an important role in the timing of sexual intercourse within some kinds of transactional relationships.

Interestingly, power asymmetries in terms of age, education, and economic status have little association with the timing to first sexual intercourse in males' relationships. Overall, young males have less asymmetric relationships compared to females along these dimensions (Samuelsen 2006). Smaller asymmetries may be associated with relationships where partners have similar preferences for sexual activity, particularly for relationships that tend to involve two adolescents, such as those for males in our setting. In contrast, females' relationships tend to involve older, more educated partners, who may be the types of individuals who desire to have sex much earlier than these young women would prefer.

In contrast to the overall gender differences we uncover in the effect of relationship context on the timing of sexual intercourse, the results regarding previous relationship experiences are similar for males and females. On the one hand, greater experience with previous relationships that involved sexual activity was associated with more rapid progression to sex in subsequent relationships. On the other hand, greater experience with nonsexual relationships delayed the time to first sexual intercourse in later relationships. These results pertain to the number and type (sexual vs. nonsexual) of previous relationship experience. We also conjectured that the *timing* of first intercourse in previous relationships could affect timing in later relationships. Indeed, our analyses found that very short duration to sex in the previous relationship was associated with shorter duration in the subsequent relationship.

In sum, our findings shed new light on the dynamics of sexual activity among young people and have implications for policies and programs aimed at ensuring safe sexual practices in all relationships. Our findings regarding the different effects of relationship commitment and resource asymmetries for young males and females suggest that messages regarding delaying sexual debut in general and the waiting time to intercourse within relationships in particular should be both gender- and relationship-specific. In addition, the finding that previous relationship experiences affect subsequent sexual behavior for both males and females suggests that targeting youth at young ages *before* they enter relationships and develop patterns of risky behavior would be useful in future programming.

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Table 1. Independent Variables at Baseline (First Month of First Relationship)

	Female	Male
Individual Characteristics		
Age (years; mean)	15.2	15.0
Enrolled in school (%)	68.2	78.6
Employed (%)	6.1	12.5
Relationship Commitment		
Relationship category		
Spouse/fiancé/fiancée (%)	5.4	3.5
Serious (%)	11.2	16.6
Dating (%)	64.3	46.7
Casual/other (%)	19.1	33.2
Maintained a concurrent partner(s) (%)	0.7	1.6
Partner had other sexual partner(s) (%)	12.3	14.7
Love as reason for relationship (%)	32.1	22.7
Physical attraction or sex as reason for relationship (%)	27.4	60.7
Resource Asymmetries		
Age difference (years; mean)	4.8	1.3
Difference in highest education level		
Partner had lower level (%)	5.4	20.1
Partner had same level (%)	59.9	65.8
Partner had higher level (%)	34.7	14.1
Money/gifts/assistance as reason for relationship (%)	15.2	2.6
Net amount of money/gifts received (amount received - amount given) (Ksh; mean)	574.0	-54.0
Partner was wealthy (%)	15.5	21.7
N	277	313

Table 3. Comparison of Median Time to Sex by Parity of the Relationship

	Parity of the Relationship					Log-Rank Test	N
	First	Second	Third	Fourth	Fifth		
Had 1 relationship	6	-	-	-	-	-	118
Had 2 relationships	5	4	-	-	-	2.48	207
Had 3 relationships	4	4	2	-	-	8.71*	143
Had 4 relationships	5	2	3	2	-	4.82	50
Had 5+ relationships	2	1	1	1	1	7.29	72
All relationships	5	3	2	1	1	48.47***	590

Note:*p<.05; **p<.01

Table 4. Conditional Gap Time Models for Time to First Sexual Intercourse within Relationships

	Female			Male		
	H.R.	R.S.E.	P>z	H.R.	R.S.E.	P>z
Individual Characteristics						
Age (years)	1.44	0.21	*	1.02	0.09	
Age (years) squared	0.99	0.00	*	1.00	0.00	
Enrolled in school (ref: no)	0.87	0.06	+	1.07	0.09	
Employed (ref: no)	0.96	0.09		1.06	0.08	
Relationship Commitment						
Relationship category (ref: serious)						
Spouse/fiancé/fiancée	0.91	0.09		0.94	0.11	
Dating	0.73	0.07	***	0.90	0.06	
Casual/other	0.72	0.08	**	1.05	0.08	
Maintained a concurrent partner(s) (ref: no)	1.09	0.13		1.10	0.09	
Partner had other sexual partner(s) (ref: no)	0.96	0.09		1.05	0.07	
Love as reason for relationship (ref: no)	1.28	0.10	**	0.90	0.06	
Physical attraction or sex as reason for relationship (ref: no)	1.09	0.09		0.96	0.05	
Resource Asymmetries						
Age difference (years)	1.00	0.01		0.97	0.01	+
Difference in highest education level (ref: same level)						
Partner had lower level	0.93	0.12		1.07	0.08	
Partner had higher level	1.01	0.08		1.00	0.07	
Money/gifts/assistance as reason for relationship (ref: no)	1.21	0.11	*	1.04	0.11	
Net amount of money/gifts received from partner (1000 KSh)	1.00	0.01		0.98	0.03	
Partner was wealthy (ref: no)	1.15	0.12		0.98	0.06	
Relationship History						
Number of nonsexual partners to date	0.10	0.04	***	0.03	0.01	***
Number of sexual partners to date	4.14	1.35	***	1.45	0.22	*
Log pseudolikelihood	-1263.5			-2023.0		
Number of relationship-months	3832			5797		

Note: ref = reference category; H.R. = hazard ratio; R.S.E. = robust standard error;+p<0.1;*p<0.05; **p<0.01; ***p<0.001.

Table 5. Conditional Gap Time Models for Time to First Sexual Intercourse within Relationships

	Model 1					
	Female			Male		
	H.R.	R.S.E.	P>z	H.R.	R.S.E.	P>z
Individual Characteristics						
Age (years)	1.27	0.35		0.93	0.11	
Age (years) squared	0.99	0.01		1.00	0.00	
Enrolled in school (ref: no)	0.98	0.13		1.07	0.12	
Employed (ref: no)	0.94	0.13		1.11	0.10	
Relationship Commitment						
Relationship category (ref: serious)						
Spouse/fiancé/fiancée	0.96	0.11		0.99	0.15	
Dating	0.95	0.15		0.86	0.09	
Casual/other	0.60	0.09	***	1.25	0.15	+
Maintained a concurrent partner(s) (ref: no)	0.64	0.11	*	1.01	0.08	
Partner had other sexual partner(s) (ref: no)	0.95	0.13		1.02	0.10	
Love as reason for relationship (ref: no)	1.45	0.21	**	0.88	0.09	
Physical attraction or sex as reason for relationship (ref: no)	1.15	0.15		0.95	0.09	
Resource Asymmetries						
Age difference (years)	0.99	0.01		0.96	0.02	+
Difference in highest educational degree (ref: same level)						
Partner had lower level	1.01	0.21		1.11	0.12	
Partner had higher level	1.11	0.15		1.02	0.09	
Money/gifts/assistance as reason for relationship (ref: no)	1.31	0.20	+	1.03	0.18	
Net amount of money/gifts received from partner (1000 KSh)	1.00	0.02		0.97	0.04	
Partner was wealthy (ref: no)	1.44	0.21	*	0.97	0.08	
Relationship History						
Number of nonsexual partners to date	0.24	0.09	***	0.08	0.02	***
Number of sexual partners to date	2.78	0.95	**	1.42	0.21	*
Proportion of previous partnerships that were sexual	--	--		--	--	
Time to first sex in previous partnership (ref: 4-6 months)						
No sex	--	--		--	--	
1-3 months	--	--		--	--	
7-12 months	--	--		--	--	
> 1 year	--	--		--	--	
Log pseudolikelihood	-718.7			-1348.9		
Number of relationship month	1499			2824		

Note: ref = reference category; H.R. = hazard ratio; R.S.E. = robust standard error

+p<0.1;*p<0.05; **p<0.01; ***p<0.001

Table 5. Conditional Gap Time Models for Time to First Sexual Intercourse within Relationships (con't)

	Model 2						Model 3					
	Female			Male			Female			Male		
	H.R.	R.S.E.	P>z	H.R.	R.S.E.	P>z	H.R.	R.S.E.	P>z	H.R.	R.S.E.	P>z
Individual Characteristics												
Age (years)	0.67	0.22		0.76	0.12	+	0.72	0.25		0.75	0.11	+
Age (years) squared	1.01	0.01		1.01	0.00		1.01	0.01		1.01	0.00	+
Enrolled in school (ref: no)	0.69	0.12	*	0.69	0.12	*	0.73	0.13	+	0.74	0.13	+
Employed (ref: no)	0.69	0.13	+	1.31	0.21	+	0.70	0.14	+	1.28	0.21	
Relationship Commitment												
Relationship category (ref: serious)												
Spouse/fiancé/fiancée	1.35	0.31		1.30	0.30		1.29	0.31		1.44	0.33	
Dating	0.57	0.10	***	0.82	0.12		0.60	0.10	**	0.82	0.12	
Casual/other	0.71	0.15	+	1.76	0.28	***	0.74	0.15		1.60	0.26	**
Maintained a concurrent partner(s) (ref: no)	0.76	0.12	+	0.88	0.10		0.74	0.12	+	0.89	0.10	
Partner had other sexual partner(s) (ref: no)	1.41	0.26	+	1.01	0.13		1.34	0.24		1.05	0.14	
Love as reason for relationship (ref: no)	1.24	0.20		1.02	0.13		1.35	0.22	+	1.02	0.13	
Physical attraction or sex as reason for relationship (ref: no)	1.30	0.22		1.36	0.17	*	1.25	0.21		1.38	0.17	**
Resource Asymmetries												
Age difference (years)	0.99	0.02		0.99	0.04		1.01	0.02		0.99	0.03	
Difference in highest educational degree (ref: same level)												
Partner had lower level	1.27	0.30		1.13	0.16		1.34	0.29		1.10	0.15	
Partner had higher level	1.53	0.23	**	1.00	0.14		1.54	0.24	**	1.01	0.15	
Money/gifts/assistance as reason for relationship (ref: no)	1.57	0.26	**	1.15	0.32		1.56	0.26	**	1.11	0.30	
Net amount of money/gifts received from partner (1000 KSh)	1.09	0.02	***	0.98	0.04		1.08	0.02	***	0.99	0.04	
Partner was wealthy (ref: no)	1.16	0.19		0.97	0.12		1.21	0.18		1.01	0.12	
Relationship History												
Number of nonsexual partners to date	--	--		--	--		--	--		--	--	
Number of sexual partners to date	--	--		--	--		--	--		--	--	
Proportion of previous partnerships that were sexual	3.09	0.60	***	2.04	0.38	***	--	--		--	--	
Time to first sex in previous partnership (ref: 4-6 months)												
No sex	--	--		--	--		0.49	0.13	**	0.55	0.11	**
1-3 months	--	--		--	--		1.91	0.43	**	1.36	0.20	*
7-12 months	--	--		--	--		1.03	0.29		0.77	0.18	
> 1 year	--	--		--	--		0.61	0.26		0.79	0.18	
Log pseudolikelihood	-942.0			-1755.7			-934.5			-1746.5		
Number of relationship month	1499			2824			1499			2824		