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Parental Family Experiences, the Timing of First Sex, and Contraception

Sarah R. Brauner-Otto

Mississippi State University

William G. Axinn

University of Michigan

Abstract

By investigating the intergenerational consequences of multiple aspects of family experiences across the life course this paper advances what we know about the forces shaping children's initiation of sexual and contraceptive behaviors. Our aim is to advance the scientific understanding of early sexual experiences by explicitly considering contraceptive use and by differentiating between the consequences of parental family experiences during childhood and those during adolescence and young adulthood. Thanks to unique, highly detailed data measuring parental family experiences throughout the life course and sexual dynamics early in life it is possible to provide detailed empirical estimates of the relationship between parental family experiences and contraceptive use at first sex—a relationship about which we know relatively little. Findings reveal (1) significant simultaneous consequences of many different dimensions of parental family experiences for the timing of first sex and the likelihood of using contraception at first sex, but the specific dimensions of family important for the specific behavior vary across racial groups; and (2) that parental family experiences influence the timing of sex and contraceptive use differently.

In recent years, many studies have investigated the relationship between the parental family and early entrances into sexual experience, primarily motivated by social concern regarding high levels of unintended, premarital, or early childbearing. However, rarely do these studies directly explore the use of contraceptives to prevent pregnancy in early sexual experiences. This is a significant gap in our understanding of early sexual experience because not all sexual encounters lead to pregnancy—careful use of effective contraceptive methods can prevent pregnancy. Our aims are to fill this gap and build upon important advances in this area by comparing the consequences of parental family experiences that occur early in the life course to those that occur later. The result is a comprehensive investigation of the relationship between parental family experiences and early sexual behavior.

The research reported here advances our understanding of these important topics in three ways. First, we explicitly integrate contraceptive behavior into theoretical reasoning about early

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Direct all correspondence to Sarah R. Brauner-Otto, PO Box C, Mississippi State University, Mississippi State, MS 39762 or srb320@msstate.edu..

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sexual experiences. Second, we provide new empirical evidence regarding the relationship between family experiences and contraceptive use at first sex—a relationship about which we know relatively little. Third, following from this new theoretical framework we integrate new dimensions of the parental family across the life course into empirical models of contraceptive use, explicitly comparing the consequences of the parental family in childhood and later in adolescence and young adulthood. These dimensions specifically differentiate among stepparents, cohabiting parents, single parents, and parental marriage and remarriage.

New empirical advances in modeling the relationships among family dynamics, sexual debut, and contraceptive use are possible because the 1995 National Survey of Family Growth (NSFG-Cycle V) includes detailed event history measures of parental family dynamics, first sex, and contraceptive use, and contains large over-samples of Hispanics and African-Americans. Similarly detailed parental event histories coupled with measures of first sex and contraception are not available in other US national data sources, including other rounds of the NSFG. The detailed life history measures of childhood living arrangements and parental marital relationships allow us to determine both the timing of first sex relative to parental family changes—such as parental cohabitations, marriages, and divorces—and the use of contraceptive methods to avoid pregnancy during that sexual experience. Together these unique measures provide the means to estimate dynamic, event-history models of first intercourse that incorporate change over the individual's life course, multiple dimensions of parental family experiences, and sexual behavior with and without contraception. The results provide new insight into the links between parental family experiences, entry into sexual relationships, and contraceptive use to reduce pregnancy risk.

Theoretical Framework

The effects of family experiences on individuals have long been of central concern to sociologists and policy makers. Research documents similarities between parents and their children both in terms of behavior and attitudes (Amato 2000; Roche, Ahmed, and Blum 2008; Axinn and Thornton 1993; Barber 2000, 2001; Dittus and Jaccard 2000; McNeely et al. 2002). Family experiences may also matter because of their relationship to parental resources. Physical monitoring and sanctions, financial rewards and punishments, or emotional support and control might all be used to shape their children's behavior (Barnes, Hoffman, and Welte 2006; Pearson, Muller, Frisco 2006; Wight, Williamson, and Henderson 2006), and parents with more resources are better able to produce children's behaviors that match parental preferences than parents with fewer resources (Axinn and Thornton 1992). However, the full spectrum of family experiences that are pertinent for understanding young women's sexual and contraceptive behavior remain unclear. This paper seeks to provide additional information on this issue by focusing on family structures and transitions.

General Principles for Studying Sex and Contraception

Most recent research on the timing of young people's entry into sexual relationships, their use of contraception, and their risk of becoming pregnant takes a strong life course perspective linking the timing of various personal experiences and contextual events to the likelihood of key transitions (e.g. Axinn and Yabiku 2001; Cavanagh 2008; Wu and Martinson 1993; Wu and Thomson 2001). Our framework incorporates both the life course perspective and potential development changes and divides parental family dynamics between two very different portions of the life course—childhood, before the vast majority of children are exposed to the risk of entering sexual relationships, and adolescence and young adulthood, the period in which the vast majority of American children have their first sexual experience.

Our study builds directly on several recent, rigorous empirical examinations of the relationship between the parental family and either sexual debut or premarital childbearing (Albrecht and

Teachman 2003; Wu 1996; Wu and Martinson 1993; Wu and Thomson 2001). Investigators find that living with a single parent, being born out of wedlock, the number of parental family transitions experienced, and experiencing a parental divorce have all been linked to these outcomes (e.g. Albrecht and Teachman 2003; Casper 1990; McLanahan 1988; McLanahan and Sandefur 1994; Thornton and Camburn 1987; Wu 1996; Wu and Martinson 1993). Specifically for sexual debut, the most advanced empirical models demonstrate that the number of parental family transitions experienced for white women and living in a single parent household for black women are the key family dynamics related to the timing of first sex (Albrecht and Teachman 2003; Wu and Thomson 2001). For premarital childbearing, studies show that the number of parental family transitions experienced is the key dimension of family dynamics producing higher rates of premarital pregnancy for black and white women (Wu 1996; Wu and Martinson 1993).

Predictions Regarding Early Sex

Childhood Parental Transitions—Several aspects of childhood parental family dynamics have the potential to influence sexual behavior. Young people with parents who entered sexual relationships early may enter sexual relationships early themselves (Inazu and Fox 1980; Thornton and Camburn 1987). Thus, young women born to young mothers are likely to have sex earlier. Because unmarried parents may also be more approving of early sex, children born to unmarried parents are more likely to engage in early sex.

Childhood exposure to different parental living arrangements may also have long-term consequences for the timing of entry into sexual relationships. Unmarried parents who enter into a new relationship via either cohabitation or marriage may expose their children to and teach them about the courtship process at young ages, thereby increasing the likelihood their children will enter courtship early. As a result, young women who lived with a single parent and his/her cohabiting partner, or a parent and a stepparent, may have sex earlier than women who only lived with their two biological parents. Additionally, women who lived with their fathers during childhood, especially early childhood, had sex later than girls who did not live with their fathers (Campa and Eckenrode 2006).

Young women who mature earlier tend to have their first sexual experiences before women who are slower to mature, and childhood parental family structure may influence children's maturation (Brooks-Gunn 1988; Brooks-Gunn and Furstenberg 1989; Cavanagh 2004). Because of time and resource constraints, single parents may engage children in household decisions and tasks more quickly than two-parent families. The addition of a stepparent, cohabiting partner, or grandparent to the household may reduce this difference, but is still not likely to equal the time and resources of two-biological-parent living arrangements. Children who help sustain the household are likely to mature more quickly and may feel that they are ready to participate in sexual relationships at earlier ages than their peers who have not been contributing to the household functioning (Chase 1999; Ellis and Essex 2007; Jurkovic 1997; Winton 2003). Consequently, we predict that young women who spent time in childhood with a single parent are more likely to engage in sexual activity early.

Parental marital transitions, both the type and number, may affect their children's sexual behavior through multiple mechanisms (McLanahan and Bumpass 1988; Thornton and Camburn 1987; Wu 1996). Here we describe how exposure to parental transitions in *childhood* may influence sexual behavior. Parental divorce typically results in mothers and children suffering financial losses, in mothers experiencing increased time constraints, and may cause increased emotional stress (Amato 2000; Chase-Lansdale and Hetherington 1990; Smock, Manning, and Gupta 1999). All of these factors may influence the children's internal motivations regarding sex; experiencing a parental divorce may lead children to turn outside of the family for emotional support, increasing the motivation to have sex at an early age

(Cherlin, Kiernan, and Chase-Lansdale 1995; Goldscheider and Goldscheider 1989, 1993). When parental divorce occurs in childhood, before most children are exposed to the risk of sexual relationships, it is most likely to affect children by changing individuals' preferences or motivations. Consequently, we expect that young women who experience a parental divorce in childhood will have sex at earlier ages.

Divorce is not the only stressful parental transition that may influence children's sexual behavior (Langenkamp and Frisco 2008). Parental marriage or remarriage may also increase sexual behavior among adolescents (McLanahan and Bumpass 1988; McLanahan and Sandefur 1994; Wu 1996). Children may feel as if they have been replaced by a stepparent and, as with parental divorce, look outside the family for emotional ties (Ganong and Coleman 1994; Giles-Sims and Finkelhor 1984; Gordon and Creighton 1988). Young women may look to substitute a sexual relationship for the relationship they previously held with their parent—as with divorce, increasing their motivation to have sex. Additionally, because witnessing their parents' involvement in the courtship process increases familiarity with courtship, children who experience a parental marriage may also be more likely to enter courtship, which often involves sexual activity (Thornton and Camburn 1987). We expect that young women who experience a parental first marriage or remarriage will have sex at earlier ages than women who do not experience one of these transitions.

Each successive parental marital and living arrangement transition places the family under additional stress (Wu 1996; Wu and Martinson 1993). With more transitions the parent-child relationship may continue to weaken, resulting in less and less communication between parents and their children regarding sex, contraceptives, and future goals. As a result, children may have less motivation to avoid sex or pregnancy, leading to sex at earlier ages. Accordingly, we predict that women who have experienced more family transitions in childhood will have sex earlier than women in more stable families.

Adolescence and Young Adulthood—Immediate parental circumstances may also influence children's sexual behavior. The research literature argues that single parents, and to a lesser extent cohabiting parents and stepfamilies, have less time to exercise social control over their children than two biological parent families (Dornbusch et al. 1985; Wu 1996; Wu and Martinson 1993). By social control we refer to the time, financial resources, authority, and influence adults may have over children. Even when the addition of a stepparent adds to the time available for parental social control, stepparents usually have less authority to exert social control than biological parents (Thomson, McLanahan, and Curtin 1992; Thornton 1991). As a result, most studies predict young women living with single parents during adolescence and young adulthood are likely to enter sexual relationships more quickly than young women living in two parent families and those living with stepparents will be in between.

Recent research on the prevalence and significance of cohabiting unions and multigenerational households implies the importance of considering these family types separately as well (Brown 2004; Cherlin and Fomby 2002; DeLeire and Kalil 2002; Kalil et al. 2002; Loomis and Landale 1994; Manning and Lamb 2003). Cohabiting partners, like stepparents, may add time and resources, but they are also likely to have less social control authority than biological parents. The same is likely true when a grandparent or other relative joins the household. To the extent social control mechanisms shape the pace of children's transition to sexual relationships, young women who live with a parent and a cohabiting partner, a grandparent, or another relative may enter sexual relationships more slowly than those living with a single parent alone, but they are still likely to enter sexual relationships more quickly than those living with two biological parents. Finally, because a stepparent may have more authority in the household than a cohabiting partner, we predict that children who live with a stepparent will have sex later than children living with a parent and his/her cohabiting partner.

Parental marital and living arrangement transitions during adolescence and young adulthood may affect children's sexual behavior independently from the specific statuses (Wu 1996; Wu and Martinson 1993). As argued above, divorce depletes parents' time and financial and emotional resources, giving them fewer tools with which to exert social control. Alternatively, when single parents marry, social control may increase due to the addition of an adult to the household. However, regardless of the type of transition, each additional one creates additional distractions for parents and guardians, thereby weakening parental control. More transitions will likely produce higher rates of children's entry into sexual relationships.

Note that parental marriage may speed up or delay sexual debut depending on the dominant mechanism. Previous research has not provided consistent evidence regarding the effect of parental marriage. One reason for this may be that researchers have not had detailed enough data to separate the effects of parental first marriage, divorce, and remarriage (Langenkamp and Frisco 2008; Seltzer 1994).

Predictions Regarding Contraceptive Use

Of course, even though sexual intercourse can lead to pregnancy, effective contraceptive use can prevent pregnancies. Crucial for this study, evidence indicates that contraceptive use at initial sexual intercourse strongly predicts the consistency of contraceptive use through later periods of sexual activity (Manlove, Ryan, and Franzetta 2004; Mauldon and Luker 1996; Reinecke, Schmidt, and Ajzen 1996). So, parental family dynamics that shape the likelihood of contraceptive use at first intercourse are an essential part of the link between family dynamics and pregnancy. Although comparatively little work investigates this issue, many of the factors identified as likely to shape the timing of first sex are also likely to shape contraceptive use at first sex.

Childhood Parental Transitions—Dimensions of childhood experience that are positive with respect to pregnancy, babies, and parenthood or negative with respect to contraception are particularly likely to influence later contraceptive use (Axinn, Clarkberg, and Thornton 1994; Duncan et al. 2001; Ryan, Franzetta, and Manlove 2007). When parents themselves had children at young ages or outside of marriage, their children are likely to be more positive toward becoming pregnant, and therefore less likely to use contraception at first intercourse. Likewise, if parents became pregnant early or outside of marriage because they were less averse to the risk of pregnancy than others, they are also likely to pass this lower risk aversion on to their children, making the children less likely to use contraception at first sex (Kapinus and Gormen 2004).

Previous research also shows that when single parents marry they often go on to become pregnant (Vikat, Thomson, and Hoem 1999; Wineberg 1990). When this marriage occurs while existing children are in childhood, it is likely to expose these young children to positive sentiments toward pregnancy and parenthood. Thus, childhood exposure to stepparents may also reduce the likelihood of using contraceptive methods at first sex. Childhood exposure to parental cohabiting partners may influence contraceptive use in the same direction, but this effect is likely to be much weaker than the effect of stepparents because cohabitators are much less likely to become pregnant than married couples (Bachrach 1987; Raley 2001; Rindfuss and VandenHeuval 1990). Young women living with a single parent during childhood may feel less social pressure to avoid pregnancy and therefore be less likely to use contraceptives than those living with two parents.

Childhood exposure to parental divorce and other parental marital living arrangement transitions is likely to produce uncertainty and stress for children. These stresses may motivate young women to seek sexual relationships as an alternative form of stability in their intimate social lives. Just as this instability may motivate sexual partnerships, the same instability may

also motivate positive attitudes toward pregnancy and childbearing. In highly unstable social situations bearing and rearing children may provide young women with an important source of intimate social stability. Young women who are more positive toward bearing and rearing children are also less likely to use contraception. Thus, young women who experience many parental family transitions in childhood may also be less likely to contracept when they have sexual relationships.

Adolescence and Young Adulthood—Immediate parental circumstances shape the level of social control parents are able to exert during adolescence and young adulthood. To the extent that parents uniformly prefer their children to engage in sexual activity with a lower risk of pregnancy, more parental social control will be linked to a higher likelihood of contraceptive use. This need not always be the case, but the vast majority of American parents prefer their children either delay sex or use contraceptive methods when having sex (Thornton 1989; Thornton and Young-DeMarco 2001). As described above, single parents, and to a lesser extent stepfamilies and cohabiting families, have less time to exercise social control over their children than two biological parent families (Dornbusch et al. 1985; Regnerus and Luchies 2006; Wu 1996; Wu and Martinson 1993). This lower social control is likely to reduce the chances of using contraception at first sex. Parental marital and living arrangement transitions also deplete parents' time and financial and emotional resources, giving them fewer tools with which to exert social control. More transitions are likely to correspond to less social control, so that more parental marital transitions will likely produce lower rates of contraceptive use at first sex.

In general, we expect children who observe their parents engaging in behavior the children may construe as positive towards sex and childbearing (i.e. dating, cohabiting, marrying, childbearing) will model these behaviors and have sex earlier and are less likely to use contraception. Children who experience multiple family situations are more likely to feel unstable and attempt to cope with this instability by establishing their own sexual relationships earlier. They may also attempt to create their own families earlier and will therefore be less likely to use contraception when they have sex. Finally, children with less supervision are more likely to engage in sex earlier and less likely to use contraception when they do so.

Racial and ethnic differences

Empirical studies consistently show that black and Hispanic women have earlier sexual debuts, higher rates of nonmarital pregnancy, and lower rates of contraceptive use than white women (Brewster 1994a; Browning, Leventhal, and Brooks-Gunn 2004; Cooksey, Rindfuss, and Guilkey 1996; Furstenberg 1987; South 1999). There are at least two possible explanations: either the different racial and ethnic groups respond the same way to various background factors but are characterized by different background factors; or they respond differently even when subject to the same background factors.¹

First, the observed behavioral differences by race and ethnicity may arise from racial and ethnic differences in those factors known to influence sexual behavior such as neighborhood characteristics, family income, and parental family experiences. Previous research reveals that blacks are more likely to have been born to an unwed or young mother, less likely to live in two-biological parent households, and more likely to live in single parent households (Loomis and Landale 1994; Morgan et al. 1993; Wu and Thomson 2001). At the same time, blacks are more likely to live in high poverty areas and in areas with a higher concentration of single

¹Biological factors have also been discussed as a possible explanation for the observed sexual behavioral differences as menarche tends to occur earlier in the life course for black women than for white women. However, recent research examining the direct link between age at menarche and the timing of sex found that although white women who reached menarche earlier had sex earlier, the relationship did not hold for black women (Cavanagh 2004). We address biological issues more below when we discuss controlling for age at menarche in our models.

parents and women who were young or unmarried at their first birth (Wilson 1987, 1996). This different social or neighborhood context may be responsible for the observed racial difference in the relationship between family dynamics and sexual behavior. However, empirical evidence regarding whether neighborhood characteristics completely account for the racial and ethnic differences in behavior that remain after controlling for family characteristics is mixed (Brewster 1994a, 1994b; Crowder and Teachman 2004; Eggebeen and Lichter 1991; South and Crowder 1999).

Or, second, the social meaning of these various factors may be different for whites, blacks, and Hispanics, thereby eliciting different responses and behaviors (Mead 1934; Wilson 1987, 1996; Sucoff and Upchurch 1998). Social interactions are an important component of the process through which individuals construct meaning of their environment and subsequently make behavioral decisions (Mead 1934). Residential segregation and differences between whites', blacks', and Hispanics' social contexts likely produce different social interactions that may foster the construction of different meanings (Massey and Denton 1993; Mead 1934). For example, in a community with a high prevalence of single parent families, having a non-marital pregnancy may not have the same social costs as it would in a community where two biological parent families are the norm (Browning and Burrington 2006; South and Baumer 2000). Inherent in most discussions of adolescent sexual behavior is the assumption that earlier sexual debut, non-use of contraception, and nonmarital pregnancies are undesirable outcomes. However, if the interactions a young woman has within her social context do not attribute a negative meaning to those outcomes, then her motivations to delay sexual debut and to use contraceptives once she does have sex will be lowered.²

There is some empirical evidence that whites and blacks respond differently to similar conditions, implying that they may attribute different meanings to those conditions (Brewster 1994a; Duncan and Rodgers 1988; McLeod and Nonnemaker 2000). Studies of cohabitation and marriage have found that the role of cohabitation in terms of childbearing is different for whites and blacks (Manning and Landale 1996). Specifically, cohabitation is much more like marriage for blacks than for whites (Loomis and Landale 1994). Recent work on non-marital childbearing illustrates the decoupling of marriage and childbearing among the poor (Edin and Kefalas 2005). Because blacks are more likely to reside in poor neighborhoods, the difference between blacks and whites sexual behavior may be a result of the combination of higher poverty rates and the different social norms regarding non-marital childbearing in poor areas.

In order to investigate the possibility that the same family dynamics shape sexual and contraceptive behaviors differently for women of different races and ethnicities, we conduct separate analyses of whites, blacks, and Hispanics. Differences in results for the groups indicate the extent to which the same theoretical framework is equally applicable among them all. Although we are not able to directly test whether white, black, or Hispanic women attribute different meanings to the same family dynamics, observed differences in estimated effects are consistent with the possibility that they may.

Data and Methods

The data for these analyses come from the 1995 National Survey of Family Growth (NSFG-Cycle V), a nationally representative survey of women aged 15–44. The sample was drawn from households who responded to the 1993 National Health Interview Survey. The NSFG-Cycle V had a complex design, over-sampling blacks and Hispanics, and a response rate of

²The specific characteristics of a young woman's community influence her decision whether to use contraception (Brewster 1994a; Geronimus 1987; Wilson 1987). While it is likely that the norms of the general population and an individual's local community both influence this decision-making process, variations in observed behavior may result from the variations in local community norms (Anderson 1999; Brewster 1994a).

79%, yielding 10,847 total interviews. For a detailed discussion of sampling procedures and study design see Kelly et al. (1997). The analyses presented in this paper use information from 1,661 non-Hispanic white, 628 non-Hispanic black, and 387 Hispanic women under age 25 at the time of the interview.³ We discuss important racial differences in the descriptive statistics and our models of sexual behavior when they occur.

Cycle V of the NSFG is the ideal data set for this study because it collected highly detailed life history calendars. These calendars include information on the exact dates and types of family transitions and of sexual intercourse, thereby enabling accurate time ordering of our key dependent and independent variables.

Measures of sexual behavior

The analyses presented in this paper focus on first voluntary, vaginal sexual intercourse after menarche.⁴ We focus on first sex because reports on the timing and characteristics of first sexual intercourse (specifically whether the respondent used contraceptives or not) may be more reliable than for later sexual events. First sexual intercourse is a memorable event, therefore women are likely to remember accurately when, and within what circumstances, it occurred (Luker 1996; Tourangeau, Rips, and Rasinski 2000).⁵ Also, substantively, first sexual intercourse is important because research has found early contraceptive practices to be indicative of later behavior (Manlove, Ryan, and Franzetta 2004; Mauldon and Luker 1996; Reinecke et al. 1996).

Our analysis has two separate components. First, because we are interested in studying the transition from never having had sex to having sex, we create a dichotomous, time-varying measure coded one in the month respondents have sex for the first time, zero in all previous months, and censored at the date of the interview if they had not yet had sex. Respondents were asked the specific month and year they first had vaginal sex and interviewers were instructed to ignore sexual activity that did not involve vaginal penetration with a male partner and to probe heavily to ensure against missing data.

Second, we are interested in women's contraceptive use when they have sex for the first time. If the respondent reported using any of the following methods she was considered to have used contraception: birth control pill, condom, partner's vasectomy, diaphragm, foam, jelly, cream, cervical cap, suppository, Today Sponge, female condom, IUD, Norplant, Depo-Provera, morning after pill, rhythm or temperature monitoring methods, withdrawal, and sterility. The specific measures are described in detail below when we present our analytic approach.

Table 1 presents descriptive statistics for these and all other variables included in the analyses. The distribution is for the last person-month of data each woman contributes. If the respondent had sex before the date of the interview the month in which she had sex is the last person-month. For women who did not have sex by the date of the interview the interview date is the last person-month. Over two-thirds of women had sex and the vast majority (70%) used a

³We use these three categories throughout the paper, however, for ease to the reader we use the terms white and black instead of non-Hispanic white and non-Hispanic black.

⁴We exclude women whose first sex was not voluntary because the guiding theoretical framework for this research is only applicable to situations in which the individual has some behavioral control. 182 women were excluded from the sample because their first sexual experience was not voluntary or was before menarche. We do not extend the hazard to first voluntary sex for women whose first sexual intercourse was non-voluntary because the non-voluntary intercourse may influence subsequent sexual behavior. Also, 1 woman reported that her first voluntary sexual intercourse was with a family member (this does not refer to a spouse)—she was deleted from the analysis sample.

⁵Not surprisingly, empirical investigations into the quality of data about first sexual intercourse have found some error associated with this information, particularly for the date or age of first sex (Upchurch et al. 2002; Wu, Martin, and Long 2001). However, this research also says that using life history calendars, as was done in the NSFG, decreases these errors. Furthermore, error increases with recall time and since we limit our to sample the youngest women in the NSFG we also reduce this key source of error.

contraceptive method during their first sexual experience. Hispanic women were the least likely to use contraceptives with fewer than half of young Hispanic women using a method the first time they had sex. Forty percent of black women who had sex did not use contraceptives and 22 percent of white women did not.

Measures of parental family

We use the life course perspective to guide our measurement construction and data analyses. The specific timing and sequencing of parental family events may be important in understanding their relationship with sexual behavior (Elder 1997). Respondents were asked the specific dates, month and year, for each family or parental transition they experienced over their life course. We use this information to create monthly time-varying variables to document multiple changes in family structure over the entire life-course—something rarely possible in nationally representative data. Following our theoretical framework we investigate separate measures of family dynamics in childhood and in adolescence and young adulthood. For both periods of the life course we create measures of family structure and of transitions.

Childhood—We define childhood to be before age ten and include parental background in this period.⁶

Parental background: We create two dichotomous measures equal to one if the respondent's mother was under age 18 when she gave birth to her first child or if the respondent's parents were unmarried when she was born. As we expect based on previous research, black and Hispanic women were more likely to have been born to young or unmarried mothers (see Table 1). We should note that this first measure may capture some biological or maturation effect on sexual behavior.

Childhood family structure: We create three measures of childhood family structure that capture whether the respondent ever lived with a stepparent, a parent's cohabiting partner, or with a single parent alone. All measures are dichotomous and equal one if the respondent ever lived in that situation and zero otherwise. Roughly 10 percent of women spent some time living with a stepparent during their childhood. Living with a cohabiting parent was rare but over a quarter had ever lived with a single parent during this period (almost 40 percent of black women). We also investigated measures of whether the respondent lived in these situations for at least 75 percent of her childhood. The results were substantively identical to those shown here. Because of the rarity of some of these family types we show the ever measures in the tables.⁷

Transitions: We create four measures of family transitions during childhood. The first three measures are dichotomous measures and equal one if the respondent had ever experienced a parental divorce, first marriage, or remarriage before age 10. Divorce was the most common transition for women of all race and ethnic groups included here with 23, 11, and 12 percent of white, black, and Hispanic women having experienced one before age 10. Experiencing a parental first marriage was rare for women from all race and ethnic groups and experiencing a parental remarriage was slightly more common, especially for white women.

The fourth measure of childhood transitions is a count of the number of transitions the respondent experienced before age 10. This measure follows previous research by including any family change such as divorce, marriage, starting or ending of parental cohabitation,

⁶Age 10 is an arbitrary cut off to define childhood. We tested models using age 12 as a cut off and found substantively similar results.

⁷Note, these measures are not mutually exclusive of one another so when all three are included in one model we are estimating the effect of living in one of these situations as opposed to not having ever lived in that situation. The comparison is not to other family types.

moving from living with one single parent to the other, moving in with other relatives, moving into or out of a group living situation, and moving out on her own (Albrecht and Teachman 2003; Wu 1996). Empirical evidence shows that in order to account for the full instability of an individual's living situation it is necessary to include more than simple marriage and divorce transitions (Raley and Wildsmith 2004). The mean number of transitions experienced before age 10 was .45 with a maximum of 7 transitions for white and black women and 11 for Hispanic women.

Adolescence and Young Adulthood

Transitions: We create similar measures of the family transitions experienced after age 10. The first two measures are time-varying, dichotomous measures and equal one if the respondent experienced a parental divorce or marriage, respectively. Because so few women experienced either a parental first marriage or remarriage after age 10 we combined these into one measure of experiencing parental marriage. These measures equal one starting the month after the respondent first experiences the event (after age 10) and continue to equal one until the end of the hazard, otherwise they equal zero. We also create a time time-varying count measure of the number of transitions experienced after age 10.

Current family structure: To capture both the number of adults living with the respondent and the respondent's relationship to those adults we created seven mutually exclusive time-varying, dichotomous measures: two married, biological parents,⁸ a biological parent and a stepparent, a single parent and his/her cohabiting partner, a single parent and grandparent(s),⁹ a single parent alone, other relatives (no parents), and a final other category that includes living in dorms, group houses, and alone. For any month only one measure can be coded as one, the other six are all coded as zero. Two married, biological parents is the reference category for our main models—to test for the statistical significance of key differences we also alternate reference categories as explained in the results.

Racial and Ethnic Differences

We took several steps to investigate racial and ethnic differences in the relationship between family structure and sexual behavior. First, we included control measures for the respondents' race and ethnic group in models using the full sample of women (white women are the reference category). Second, we estimated all models separately for white, black, and Hispanic women. Third, we estimated fully interacted models with pair comparisons (white vs. black, black vs. Hispanic, and Hispanic vs. white) to determine whether any observed differences in the separate race models were statistically significant. In the end, we found few racial or ethnic differences regarding the timing of first sex and therefore present only those results from the first approach in the tables below. We do discuss any statistically significant racial or ethnic differences in the text. We found substantially more differences regarding contraceptive use and therefore do present those results in the tables below.

⁸This includes 22 women who were living with two adopted parents and 5 women who were living with two biological cohabiting parents. We tested whether there was a separate effect of living with adopted parents but found similar behavioral patterns for two biological and two adopted parent households. For parsimony, we combined biological and adopted into one group and refer to them as two biological, married households. We also tested models where the 5 women with biological cohabiting parents were considered cohabiting and not married—there was no significant difference between those models and the ones presented here. Because these five women lived with their cohabiting biological parents for most of or all of their lives we felt they were more similar to married biological parent households than to households with a single parent and his/her cohabiting partner.

⁹This includes 414 person months from five women who lived with a single parent and an aunt or an uncle. We also ran analysis including these person months in the other category and results were not different from those presented here.

Controls

Our multivariate models include measures of characteristics that may influence the likelihood of experiencing a specific family structure, transition, and an individual's sexual behavior. These control measures are all time-invariant, are described below, and reported in Table 1. We also include measures for age that are described later.

We include two controls that help to address biological influences on sexual behavior. The first is a measure of the total number of children the respondent's mother gave birth to. We include this as a continuous variable and it ranges from 0 to 17. The second, age at menarche, is also included as a continuous measure. Girls who physically develop earlier may engage in sexual activity earlier (Brooks-Gunn 1988; Brooks-Gunn and Furstenberg 1989; Cavanagh 2004). Since we are concerned with the timing of sexual behavior these are important controls.¹⁰

Family income may play an important role in determining sexual behavior. Financial resources are important in terms of social control because families with fewer resources may be less able to carry out their social control desires—they have fewer resources with which to motivate their children (Axinn and Thornton 1992). Nevertheless, research on family formation has shown that economic resources do not account for the full effects of family change (Hogan and Kitagawa 1985; McLanahan 1988; Thornton 1991; Wu 1996). Thus, we expect to find effects of family dynamics independent of the effects of financial resources. However, because it is possible that such resources play a role in these processes, we use parental education to measure parents' socio-economic resources. Educational attainment is an attractive measure of resources in the parental family because it is a less volatile indicator of parents' long-term resource trajectories than their income or assets at any single point in time (Xie et al. 2003). Also, research has found that parental education is a significant predictor of sexual activity (Axinn and Barber 2001; Thornton and Camburn 1987). Parental education is included as two continuous measures, one for female parent and one for male parent during childhood, and reflects the highest grade the parent completed. If a parent had obtained any education beyond 18 years, they were coded as 19.¹¹

Religion is another factor found to be related to sexual activity and family structure (Browning and Burrington 2006; Manlove, Logan, Moore, and Ikramullah 2008; Manning and Landale 1996; Morgan et al. 1993; Thornton, Axinn, and Hill 1992). We measure religion with six dichotomous indicators for: non-fundamentalist Protestant, Catholic, Baptist, fundamentalist Protestant or Mormon, other, and no religion reported. The reference category is non-fundamentalist Protestant.

Analytic Techniques

Our analysis consists of two parts. First, we estimate event history models of the hazard of first sexual intercourse. The hazard, or period of risk, begins for each woman when she turns ten years old. The unit of analysis is person-months of exposure to first sex. The dataset contains observations for each month between the respondent's 10th birthday and the month in which she had sex or the month of the interview if she did not have sex. We use discrete-time methods, described below, to estimate the models. The hazard ends either the month the respondent had

¹⁰There is some evidence that family dynamics may be related to the timing of menarche which then predicts the timing of first sexual intercourse (Chisholm et al. 2005; Ellis and Essex 2007). That is, physical maturation may be a mechanism through which family dynamics influence sexual behavior. In this case, our estimates of the effect of family dynamics on the timing of first sex would be underestimates. Since this is not the focus of our paper we do not explore this possibility, we merely control for age at menarche.

¹¹Respondents were asked to report this information for their main caregiver of that sex during their childhood. Some respondents did not report a male or a female caregiver. These respondents were assigned the mean value for the missing parent's education. It was therefore necessary to include two dichotomous measures equal to one for those respondents. Although it may appear that including these controls for missing parental education information over control for family type, we estimated the models with and without these controls and found no substantial differences between models.

sex or, if she did not have sex, the month of the interview.¹² We use age in months and age in months squared to estimate the baseline hazard of first sex. The mean age at first sex was just under 17 years old (Table 1) and the mean number of years between first sex and the interview was roughly 3 years.

Second, we look at contraceptive use at first sexual experience. There are at least three different ways to conceptualize how to study contraceptive use at first sex, each corresponding with a different methodological approach. First, we can think of contraceptive behavior at first sex as the result of two separate, sequential decisions. In this conceptualization, a woman decides first whether to have sex. If she decides to have sex, she then decides whether to use contraception. Following this conceptualization, the appropriate analytic strategy is to first model the transition to sex, as we describe above, and then to limit the sample to those women who have sex and estimate a simple logistic regression of whether they used contraception the first time they had sex.

Second, we can think of women simultaneously deciding between three alternatives: to not have sex, to have sex using contraception, or to have sex not using contraception. Under this conceptualization we are still assuming that women make two separate decisions, but because they are decided simultaneously they yield three equivalent behaviors. Following this conceptualization, the appropriate modeling strategy is to model the comparisons between all three categories using a multinomial logistic hazard model (simultaneous alternatives).

Third, instead of it being two separate decisions, women may feel they are faced with one decision that combines both whether to engage in sexual behavior and whether to use contraception. That is, the decision to use contraception is in fact embedded in the decision to have sex. Following this conceptualization, a typical demographic approach decomposes the overall hazard of having sex into its components, having sex using contraception and having sex without using contraception¹³. The appropriate modeling strategy for this conceptualization is a competing risks hazard framework where we model both (1) the transition from not having had sex to having had sex *using* contraceptives, and (2) the transition from not having had sex to having had sex *not using* contraceptives. A competing risk formulation of contraceptive use avoids making the assumptions discussed above with the other two conceptualizations—those regarding the relative timing of the decisions to have sex and to use contraceptives and about the relative equivalency of each behavior. Additionally, it is also possible that women make decisions regarding contraceptive use before they have decided to have sex—a young woman may feel that whenever she has sex she will (or will not) use contraceptives, without determining when specifically she will have sex. The competing risks framework allows us to examine the observed behavioral outcomes without making any of these assumptions regarding the timing of the actual decisions themselves.

We conduct all three modeling strategies to investigate all three conceptualizations. For ease to the reader, we present only the results from the final approach, the competing risks. We discuss where the different approaches yield different findings in the results section. Details and tables for the others, the simple logistic regression of contraceptive use among women who had sex and multinomial hazard models, can be obtained from the authors.

¹²Note that previous methodological research demonstrates that including multiple time periods of observation per person in a discrete-time hazard model does not artificially deflate standard errors or create artificial correlations among observations (Allison 1982, 1984; Petersen 1986, 1991; Yamaguchi 1991). Moreover, discrete-time hazard models based on person-month units of analysis are generally characterized by extremely low levels of time aggregation bias, yielding results quite similar to continuous time alternatives (Allison 1982, 1984; Yamaguchi 1991).

¹³This type of competing risks framework has been used successfully to study marital transitions in several previous studies (Ghimire, Axinn, Yabiku, and Thornton 2006; Hill, Axinn, and Thornton 1993; Thornton, Axinn, and Teachman 1995).

For the competing risk hazard models we disaggregate the total rate of first sex and consider contraceptive use and non-use at first sexual intercourse separately, with sex using contraception and sex not using contraception treated as competing-risks that terminate the state of never having had sex. In the analysis of sex using contraceptives, first sex without contraception is treated as a competing risk and cases are censored if this event occurs. The opposite occurs in the analysis of sex not using contraceptives. For this approach we need two measures to correspond with the two separate transition models, having sex using contraception and having sex not using contraception. Both measures are dichotomous, time-varying, and coded one in the month the respondent had sex using contraceptives (or had sex not using contraceptives for the second transition), and zero in the months prior to having had sex. Cases are censored at the date of the interview if the respondent had not yet had sex. As with the hazard models of first sex, the hazard begins for each woman when she turns ten years old and the unit of analysis is person-months of exposure to first sex.

The hazard of first sex and the competing risk models are estimated using logistic regression in the form:

$$\ln\left(\frac{p}{1-p}\right) = a + \sum (\beta_k)(X_k).$$

For the analyses estimating the hazard of first sex, p is the probability of having sex, $p/1-p$ is the odds of sex occurring, a is a constant term, β_k represents the effects parameters of the explanatory variables, and X_k represents the explanatory variables in the model (Allison 1982, 1984). Note that because the time interval we investigate—person-months—is quite brief, the odds are extremely similar to the rate so we will discuss the rates of first sex and contraceptive use at first sex.

We construct nested models following a life course perspective, beginning with the parental family structure at birth and adding changes as the child ages. This approach also helps account for developmental effects that may interact with family structure. We begin with the hazard of first sex. We first estimate models with events that happened before the respondent's birth (parental background). We then add in the measures of childhood family structure and then of transitions during childhood. Next, we include the measures of transitions in adolescence and young adulthood. The final model adds in the measures of family structure in adolescence and young adulthood. We then repeat these steps for the competing risk hazards of contraceptive use at first sex.

Results

Table 2 presents results for the hazard of first sex for the full sample. The coefficients displayed are the multiplicative effects on the rate of first sex in a one-month interval. An exponentiated effect greater than 1.00 represents a positive effect, less than 1.00 a negative effect, and equal to 1.00 no effect on the odds. Boxes are to draw the reader's attention to comparisons across models and life course specifications.

First sexual intercourse

Childhood—Model 1 shows the effects of the measures of family structure and transitions in childhood.

Parental background: Women whose mothers were under age 18 at their first birth had higher rates of sexual intercourse than women whose mothers were older at their first birth. The estimate of 1.70 for the odds multiplier means that women whose mothers were under 18 at

their first birth had rates of first sex 70 percent higher those whose mothers were over 18. Similarly, women whose parents were unmarried at the time of the respondent's birth had their first sexual intercourse earlier. Both of these results are consistent with previous research and with our predictions (Albrecht and Teachman 2003; Barber 2001; McLanahan 1988; McLanahan and Sandefur 1994).

Childhood family structure: Women who ever lived with a stepparent or with a single parent alone in childhood had sex earlier than women who did not experience these family structures. These effects do not hold for black women (not in tables). In models with only black women we find that there is no effect of having lived with a step or single parent on their rate of first sex and interaction terms comparing whites and blacks show these differences to be statistically significant.

Transitions: In line with previous research, experiencing a parental divorce was associated with higher rates of sexual intercourse (Albrecht and Teachman 2003; Thornton and Camburn 1987; McLanahan and Sandefur 1994). As with our findings for childhood family structure, this effect is not true for black women. Because we are able to examine family transitions in such detail, we also find evidence that women whose parents remarried initiated sexual intercourse *later* than women who did not experience this transition. However, we find that the delaying effect of parental marriage does not apply to Hispanic women. It is worth noting that in other analyses not shown here we find a similar effect for experiencing any parental marriage, first or remarriage, on white and black women's hazard of first sex. For black and white women, the mechanism for both types of marriage is the same—it represents a stabilizing situation—but the effect is less clear for Hispanic women. In separate analyses not shown in tables, we estimated the effect of these measures of type of transition one at a time and found no difference from those effects presented here.

Our findings regarding the effect of the number of transitions experienced before age 10 run counter to previous research (Wu 1996; Wu and Martinson 1993). Whereas previous research on the relationship between transitions and premarital pregnancy has found the number of transitions to be the most important aspect of family structure, our measure of the number of transitions experienced in childhood was not statistically significant. It may be that this measure influences contraceptive use and not the timing of sex, a task to which we turn later in this paper.

Adolescence and Young Adulthood

Transitions: In Model 2 we add in the measures of family transitions that occurred during adolescence and young adulthood. There are two important findings in this model. First, although the number of transitions experienced in childhood was not statistically related to the timing of first sex, those experienced later in life were. The effect shown here is multiplicative so women who experienced one transition had rates of sexual intercourse 18 percent higher than women who experienced none. Women who experienced 8 transitions after age 10, the maximum number reported by any respondent, had rates of sex 276 percent ($1.18^8=3.76$) higher than women who experienced no transitions. Because it is the number of transitions that occur in adolescence that are significant, and not those that occur in childhood, it may be that the number of transitions effects the timing of first sex largely through social control or that the effect of family transitions depends on the individual's developmental stage when the transitions occurred.

Second, including these measures of later transitions in the model makes the effect of experiencing a divorce in childhood insignificant (see the box drawn over Models 1 and 2 for parental divorce in childhood). In other analyses not shown we see that this change occurs as

a result of including this full combination of later life family transitions in the model, and not primarily through the inclusion of one specific measure. Thus, the effect of divorce on the timing of first sex appears to be due to the instability produced by divorce, of which early divorce is symptomatic, and not by the divorce itself.

Current family structure: Finally, in Model 3, we add in the measures for current family structure. There are multiple findings to note here. First, essentially all of the measures of current family structure were significantly related to the rate of sexual intercourse, meaning that women living with two married, biological parents (the reference category) had lower rates of sexual intercourse than women in other types of living situations. Women living with a stepparent and single parents (with grandparent(s) or alone) had rates of sexual intercourse 34, 58, and 25 percent higher than women living in two-parent households. This is counter to existing research showing that children and adolescents in multigenerational households fare as well as those in two married parent households (Deleire and Kalil 2002; Kalil et al. 2002). Although the measure of currently living with a parent and his/her cohabiting partner was not statistically significant at the .05 level, it was at the .10 level and had a similar relationship when compared to two biological parent family as well as step or single parents.

We also tested models that compared these measures of current family structure with each other, not just with two married parents (results not in tables). We found no significant differences in the timing of first sex among those living with a stepparent, a single parent and his/her cohabiting partner, grandparent(s), or alone. That is, although Model 3 shows different odds ratios for these different family structures, they are not statistically significantly different from each other, only from the reference group of two married, biological parents.

A second noteworthy finding here is that when measures of current family structure are included in the model the effect of some of the measures of family dynamics earlier in the life course are no longer statistically significant or the effect sizes decrease. Living with a single parent during childhood ceases to have a significant effect on the hazard of first sex, and the effect estimates for parental marital status at birth and living with a stepparent in childhood decrease once you account for later life family structures.

Previous research often only focuses on current living situation or creates a snapshot measure of some previous point in time to capture family structure. It is rare to have such detailed, time dependent measures of parental background, family structure, and family transitions as we have. Our findings show that at least some of the effect previously attributed to these less complex measures is in fact due to other aspects of family structure and parental family experience. Specifically, our findings suggest that: 1) the effect of living with a single parent in childhood operates to affect the timing of first sex via family structure and experiences later in life; and 2) the commonly cited effect of experiencing a parental divorce may be due to two specific mechanisms—the instability of this transition and the resulting family living arrangement.

Our models also show that even with a wide range of current experience measures, important independent effects of early life experiences remain. Neither living with a stepparent in childhood nor parents' marital and childbearing experiences before one's own birth can be fully explained by subsequent family experiences or living arrangements. These early life experiences appear to have long-term consequences for the sexual behavior of young women.

The findings from these complex models that incorporate the specific timing of changes in family structure yield somewhat different conclusions from previous research. As we have already mentioned, we find only minimal support for the idea that having adults in addition to a single parent in the household serves as a protective factor for young white women. Also,

although other research has found the number of transitions experienced to be the key influential feature of family structure, we find many more dimensions of family structure to be related to the timing of first sex independent of the number of transitions than others have found (Albrecht and Teachman 2003; Wu and Thomson 2001).

We found only a few noteworthy differences in the relationship between family structure and the timing of first sex across race and ethnic groups, particularly in terms of childhood experiences. The effect of living with a stepparent or single parent before age ten does not influence the timing of first sex for black women but it does for white women. Also, experiencing a parental marriage seems to influence Hispanic women differently than non-Hispanic women, although very few Hispanic women experienced these events so we should not draw too large of conclusions.¹⁴

Contraceptive use

As we discuss above, the relationship between family dynamics and contraceptive use has been studied far less intensively than that with first sex. We address this gap in the literature by building directly on the complex, dynamic multivariate models of the timing of first sex we describe above and disaggregate the total rate of transition to first sexual experience into the rate of first sex using contraceptive methods versus the rate of first sex not using contraceptive methods. These results are presented in Table 3. Model 1, labeled “Using Contraception,” contains the estimates of the hazard of using contraceptives at first sex. Model 2, labeled “Not Using Contraception,” contains the estimates of the hazard of not using contraceptives at first sex. Table 4 presents the same models by race and ethnicity. The relationship between a particular parental family dynamic and the likelihood of using contraception is determined by the *difference* between the coefficients in the two separate hazard models. When the effect estimate for an aspect of family dynamics differs across the competing risks we can ascertain its effect on contraceptive use as separate from its effect on the timing of sex.

Consider the effect of having a mother under age 18 at her first birth. Looking at Table 3 we see statistically significant effects of greater than 1.00 in models of first sex both using and not using contraception. Because, the effect is quite similar in both models (in the same direction) we interpret this to mean that having a mother who was herself a young mother speeds up the transition to first sex, but has no influence on whether or not a young woman uses contraception during that first sexual experience. This interpretation is further supported by the logistic regression of contraceptive use among women who had sex and the multinomial hazard models which found no significant effect of mother's age at her first birth on the woman's contraceptive use (not in tables).

There are no instances in the competing risks hazard models where there are statistically significant effects in opposite directions, however, there are several where a measure of a specific family structure has a significant effect on one risk but not on the other. We mark these aspects of family dynamics that appear to effect contraceptive use with boxes in this table. Those findings supported by estimates from the other two approaches are marked with double lined boxes. For instance, we see that being born to an unmarried mother is statistically significantly related to the hazard of sex using contraception but not to the hazard of sex without contraception implying that women whose parents were unmarried when they were born have higher rates of contraceptive use than those whose parents were married (statistical significance of this effect was found in the logit of contraceptive use models and in the multinomial hazard

¹⁴All the models have high Chi-square likelihood ratios revealing that the models are significant improvements over a model with only a constant. As you might expect, because many of the specific variables in each successive model are not themselves statistically significant, comparison of model fit statistics across models reveals that Models 2 and 3 are not significant improvements over Model 1.

models). In analysis by race and ethnicity we found that this was true for black women (Table 4, Models 3 and 4) and Hispanic women (Models 5 and 6) but not for white (Models 1 and 2).

We found evidence that several other aspects of family structure were also related to higher rates of sex with contraception. For example, experiencing a parental divorce before age 10 was related to a higher rate of contraceptive use and this is true across race and ethnic groups (Table 3). Experiencing a parental first marriage was associated with a lower rate of sex not using contraception, or an increase in contraceptive use. Currently living with a stepparent, a parent and his/her cohabiting partner, or with a single parent alone were also related to a higher rate of contraceptive use.

All of these results are not consistent across race and ethnic groups as we can see in Table 4. First, the effect of currently living with a parent and his/her cohabiting partner appears to be driven largely by white women (Table 4, Models 1 and 2). The effect was not statistically significant for black (Models 3 and 4) or Hispanic women (Models 5 and 6). Second, we found contrasting effects for the effect of currently living with a single parent alone for whites and non-whites. Specifically, living with a single parent alone was associated with higher rates of sex *without* using contraception for white women, but with using contraception for black and Hispanic women. Third, the effects of parents' marital status at birth and currently living with a stepparent did not hold for white women, but did for black and Hispanic women.

Other aspects of family structure were also associated with decreases in contraceptive use. These are evidenced by increases in the hazard of sex not using contraception and not in that of sex using contraception, or decreases in the hazard of sex using contraception and not in that of sex not using contraception, along with the simple logistic and multinomial regressions. Living with a stepparent or single parent during childhood were both positive and statistically significant in the hazard of sex not using contraception and had significant negative effects in the logit of contraceptive use and the multinomial models, implying that living in either of these two family structures in childhood is associated with less contraceptive use later in life (Table 3). These findings were consistent across race and ethnicity groups, although not statistically significant for Hispanic women (Table 4). We also found that women currently living in multigenerational households had lower rates of contraceptive use.

An interesting finding regarding differences by race and ethnic group concerns the effect of the number of transitions experienced in adolescence. Specifically, the effect of the number of transitions during adolescence and young adulthood had opposite effects for white and black women. Higher numbers of transitions was associated with an increased rate of sex using contraception for white women, but with sex not using contraception for black women (Table 4).

A key contribution of this paper is our ability to focus on the specific effects of having experienced a parental divorce, first marriage, and/or remarriage. Looking at Table 3 we see that these do have different effects on women's later life contraceptive use. Experiencing a parental divorce or first marriage during childhood were associated with increased contraceptive use, but experiencing a remarriage at this point in the life course was associated with less use. Unfortunately, despite the oversampling of blacks and Hispanics in these data we still have few women experiencing these events, making investigations by race and ethnicity limited. It appears that experiencing a parental remarriage during childhood may influence white women in the opposite way as it influences black and Hispanic women, but because this conclusion is based largely on not finding statistical relationships we caution the reader from drawing too much from this (Table 4). Similarly, we are unable to determine if there are different effects of having experienced these events in adolescence and young adulthood by

race and ethnicity. Future research that can draw an even greater sample of black and Hispanic women may be able to address these questions.

Discussion and Conclusion

Most of the research on young women's sexual behavior is motivated by concerns about teenage and unintended childbearing, especially its consequences for both the mother and the child (Axinn, Barber, and Thornton 1998; Barber, Axinn, and Thornton 1999; Finer and Henshaw 2006; McLanahan and Bumpass 1988). The most recent estimates show that teenage pregnancy rates have increased for the first time in 14 years (Federal Interagency Forum on Child and Family Statistics 2008) and eighty-two percent of pregnancies to 15–19 year olds were unintended (Finer and Henshaw 2006). Because contraceptive use is a necessary step between having sex and becoming pregnant, to ignore it is to ignore a key step between having sex and giving birth.¹⁵ We argue the effects of parents' marital experiences and living arrangements are not the same for contraceptive use as they are for rates of first sex, so that contraceptive use per se deserves greater attention from researchers. Furthermore, ignoring the full complexity of parental family transitions over the life course is also problematic. Our analysis shows that without analyzing multiple aspects of family structure and transitions, researchers may draw erroneous conclusions regarding the relationship between parental family transitions and children's sexual behavior.

For the pace of entering sexual relationships, we clearly see the importance in incorporating measures of family structure from across the life course. Some effects of family structure are actually due to other, later life situations. Specifically, we found that in a model with only measures of experiences during childhood, experiencing a parental divorce appeared to be related to earlier sexual debut. However, once we account for the general instability a woman experienced later on life we see that experiencing a parental divorce during childhood is no longer related to the timing of first sex. Similarly, living with a single parent during childhood appears to speed up entry until we account for current living situation.

At the same time, we do find persistent, long-term effects of other childhood family structures and transitions that are consistent with previous research on young women's sexual behavior and pregnancy. Parental childbearing and marital experiences in one's childhood have strong, statistically significant effects increasing the rate of entry into sexual relationships that are not explained by a wide range of subsequent parental family experiences. Later life parental family experiences were also strongly associated with children's sexual behavior—increasing numbers of parental family transitions and currently living with anyone other than two married parents both significantly raised rates of first sexual intercourse. The independent effect of the number of parental family transitions is consistent with previous research arguing that the instability produced by these transitions exerts its own independent influence accelerating the entry of young women into sexual relationships (Albrecht and Teachman 2003; Wu and Thompson 2001).

Because different family structures and transitions at different points in the life course may simultaneously influence sexual debut our models show what may appear to be conflicting findings. For instance, living with a stepparent during childhood was related to earlier sexual debut but experiencing a parental marriage was related to later debut. These seeming inconsistencies likely occur because they operate through separate mechanisms. Living with a stepparent may speed up sexual debut because parents model dating and sexual behavior that

¹⁵While contraceptive failures do occur, sex without protection from pregnancy is the major cause of unintended pregnancy (Mosher 1990).

children then emulate. Experiencing a parental marriage may postpone debut because the marriage provides an additional adult to monitor the child's behavior.

Adding contraceptive use to our conceptualization of the transition to first sexual experience reveals many new insights into the relationship between parental family marital experiences and the risk of early pregnancy. Importantly we find that the aspects that speed up sexual debut do not uniformly influence contraceptive use—some are related to higher rates of use while others to lower rates. Being born to unmarried parents, experiencing a parental divorce in childhood, and currently living with a stepparent or a parent and his/her cohabiting partner were all related to earlier sexual debut, but also increased use of contraception. On the other hand, living with a step or single parent during childhood and currently living in a multigenerational household greatly reduced the chances of contraceptive use at first sex.

We find that many childhood factors have strong, long-lasting effects on behavior that are not explained by subsequent parental family marital experiences or living arrangements. This points towards the importance of socialization for later decisions about contracepting and highlights that early interventions may be particularly important for sexual behavior.

Our thorough investigation into the relationship between family structure and contraceptive use that included examining multiple conceptualizations of the decision-making process yields an important finding. Because our three approaches yield different results, we see the importance in having a firm theoretical conceptualization of the behavior in question when applying statistical analyses. Detailed attention to the assumptions regarding the relative timing of the decisions to have sex and use contraception reveals an important effect of current living situation on contraceptive use at first sex. Investigated with only a simple logistic regression model of contraceptive use among those who had sex or a multinomial model assuming equivalence of the decisions to have sex and contracept, investigators may miss key dimensions of the relationship between family structure and contraceptive use at first sex.

It appears that family experiences have different effects on contraceptive use, and to a lesser degree on the timing of sex, for white, black, and Hispanic women. For instance, family instability appears to increase the likelihood of contraceptive use at first sex among whites but decreases contraceptive use among blacks. Also, currently living with a step or single parent is associated with less contraceptive use for whites but more use for blacks and Hispanics. On the other hand, currently living with a parent and his/her cohabiting partner was associated with increased contraceptive use for whites and Hispanics but lowered use for blacks. We found that the accelerating effect of living with a step or single parent or experiencing a parental divorce before age 10 on the timing of first sex does not exist for black women. Parental marriage may increase the speed of Hispanic women's entry into sex but delay sex for non-Hispanic women. As we discussed above, previous empirical findings point to community context, including specific attention to the interactions that occur within an individual's community, as a social factor likely to produce such differences in the ways different groups respond to the same experiences (Browning et al. 2004, 2005; Sampson, Morenoff, and Earls 1999). However, it is quite likely that the race and ethnic differences we document are produced, at least to some extent, by differences in meaning and interpretation that span across multiple community contexts. Research designed to understand the meanings of specific family dynamics and individual variation in attachment to those meanings may help advance a more comprehensive theoretical framework to predict non-white women's sexual behavior (e.g. Edin and Kefalas 2005).

The research presented here yields important conclusions that significantly advance our understanding of the processes leading to pregnancy.¹⁶ First, we see that adding the explicit investigation of contraceptive use does reveal consequences of parental family experience that

are different than those revealed by investigations of the timing of sexual debut only. This finding provides evidence that a comprehensive understanding of the relationship between parental family experience and premarital or unintended pregnancy must involve explicit consideration of contraception. Research on these relationships will be misleading if it ignores contraceptive use as a fundamental element of this process.

Second, the process through which family structure and transitions influence childbearing varies by race and ethnicity, particularly in terms of contraceptive use. Although our findings regarding the timing of first sex were fairly consistent for black, white, and Hispanic women, those regarding contraceptive use were less so. In particular, instability and current living situations had opposite effects on contraceptive use for black and white women.

Third, because our detailed models are able to differentiate among experiences occurring at various points in the life course, we are able to see that family structure in childhood can have a very different effect on the risk of pregnancy than family structure later in life. For instance, we find that living with a step or single parent in childhood decreases the likelihood of using contraception, but for black and Hispanic women, those same family structures during adolescences and young adulthood were associated with increased contraceptive use (differences likely due to the mechanisms at work). Overall then, the comprehensive analysis we present here points toward investigation of contraceptive use as a high priority in advancing our understanding of race and ethnic differences in the ways that family experiences shape pregnancy.

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¹⁶These data are from 1995 and as a result the conclusions drawn from these analyses hold for the time period before 1995. The bulk of changes in the family, especially in terms of divorce occurred before 1980, and not between 1990 and 2010 (Goldstein 1999; Kreider and Elliott 2009). Cohabitation and non-marital childbearing have continued to increase, although again, not as much as they changed before the '90s (Ventura 2009). Because the family has changed less since these data were collected it is likely our conclusions would still hold. However, given the steady increases in cohabitation and non-marital childbearing across racial groups it is possible that our findings for whites, who have lower rates of cohabitation and non-marital childbearing in these data, may more closely resemble those of blacks. Of course, research that is able to replicate the current study with detailed, time ordered measures of multiple dimensions of family structure and sexual behavior with more recent data would be an important test of this.

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Table 1
Descriptive Statistics: Sexual behavior, family structures and transitions, and control measures.

	Full Sample			Non-Hispanic Whites			Non-Hispanic Blacks			Hispanics		
	Mean	SD	Max	Mean	SD	Max	Mean	SD	Max	Mean	SD	Max
Sexual Behavior												
Had sex	0.66	0	1	0.64	0	1	0.71	0	1	0.65	0	1
Did not use contraception (if had sex)	0.31	0	1	0.22	0	1	0.40	0	1	0.53	0	1
Family Structures and Transitions												
Childhood (before age 10)												
Parental background												
Mother was under age 18 at her first birth	0.17	0	1	0.10	0	1	0.29	0	1	0.26	0	1
Parents unmarried at birth	0.16	0	1	0.06	0	1	0.42	0	1	0.17	0	1
Family structure (ever lived before age 10)												
Stepparent and one biological parent	0.11	0	1	0.12	0	1	0.10	0	1	0.09	0	1
One biological parent and his/her cohabiting partner	0.04	0	1	0.03	0	1	0.03	0	1	0.05	0	1
Single parent alone	0.27	0	1	0.23	0	1	0.39	0	1	0.26	0	1
Transitions (ever experienced before age 10)												
Parental divorce	0.19	0	1	0.23	0	1	0.11	0	1	0.12	0	1
Parental first marriage	0.02	0	1	0.01	0	1	0.03	0	1	0.02	0	1
Parental remarriage	0.10	0	1	0.12	0	1	0.07	0	1	0.07	0	1
Number of transitions experienced	0.45	0.89	11	0.46	0.91	7	0.43	0.80	7	0.45	0.97	11
Adolescence and Young Adulthood (time varying, previous month)												
Transitions												
Parental divorce	0.01	0	1	0.01	0	1	0.01	0	1	0.00	0	1
Parental marriage (first or remarriage)	0.03	0	1	0.03	0	1	0.01	0	1	0.01	0	1
Number of transitions experienced	0.46	0	1	0.49	0.86	8	0.37	0.72	5	0.44	0.80	4
Current family structure												
Two married, biological parents	0.47	0	1	0.52	0	1	0.34	0	1	0.49	0	1
Stepparent and one biological parent	0.12	0	1	0.13	0	1	0.10	0	1	0.09	0	1
One biological parent and his/her cohabiting	0.023	0	1	0.02	0	1	0.02	0	1	0.03	0	1
Single parent with grandparent(s)	0.02	0	1	0.01	0	1	0.04	0	1	0.02	0	1
Single parent alone	0.21	0	1	0.17	0	1	0.34	0	1	0.20	0	1

	Full Sample			Non-Hispanic Whites			Non-Hispanic Blacks			Hispanics			
	Mean	SD	Max	Min	Max	Mean	SD	Max	Min	Max	Mean	SD	Max
Other relatives	0.02		1	0	1	0.01		1	0	1	0.05		1
Non-family household	0.13		1	0	1	0.15		1	0	1	0.10		1
Controls													
Mother's total number of children born	3.16	1.86	17	0	12	2.82	1.29	17	0	12	3.57	2.37	17
Age at menarche	12.4	1.50	18	7	18	12.51	1.43	18	7	18	12.32	1.64	18
Parental education													
Father's education	12.73	3.29	19	0	19	13.41	2.82	19	0	19	12.24	2.92	19
Mother's education	12.34	3.16	19	0	19	12.98	2.64	19	0	19	12.11	2.89	19
Religion													
Non-fundamentalist Protestant	0.21		1	0	1	0.29		1	0	1	0.12		1
Catholic	0.30		1	0	1	0.28		1	0	1	0.09		1
Baptist	0.27		1	0	1	0.19		1	0	1	0.61		1
Fundamentalist Protestant	0.09		1	0	1	0.09		1	0	1	0.09		1
Other religion	0.03		1	0	1	0.03		1	0	1	0.02		1
No religion	0.10		1	0	1	0.11		1	0	1	0.08		1
Age (years old at first intercourse or at date of censor if never had sex)	16.76	2.25	24.67	10.75	24.67	16.90	2.23	24.67	10.92	24.67	16.24	2.11	24.00
N	2676					1661					628		387

NOTE: Time-varying information is taken from the last month of data in the analysis.

Table 2

Hazard Model Estimates: Relationship Between Family Structure and Rate of First Intercourse, Full Sample

	Model 1	Model 2	Model 3
Controls			
Non-Hispanic Black	1.17* (2.18)	1.17* (2.25)	1.14* (1.85)
Hispanic	0.71*** (-3.94)	0.70*** (-4.17)	0.69*** (-4.23)
Mother's total number of children ever born	0.96** (-3.03)	0.96** (-2.92)	0.96** (-2.86)
Age at menarche	0.92*** (-5.33)	0.92*** (-5.21)	0.92*** (-5.39)
Parental education ^b			
Father's education	0.97*** (-3.43)	0.97*** (-3.49)	0.97*** (-3.46)
Mother's education	0.99 (-1.36)	0.99 (-1.57)	0.99 (-1.46)
Religion ^c			
Catholic	0.92 (-1.15)	0.93 (-1.02)	0.92 (-1.09)
Baptist	0.90 (-1.44)	0.90 (-1.45)	0.89 (-1.57)
Fundamentalist Protestant	0.70*** (-3.51)	0.69*** (-3.56)	0.69*** (-3.56)
Other religion	0.63** (-2.76)	0.64** (-2.70)	0.64** (-2.65)
No religion	1.11 (1.15)	1.13 (1.31)	1.12 (1.21)
Age (months since 10th birthday)	1.29*** (23.01)	1.29*** (23.05)	1.29*** (22.33)
Age squared (months since 10th birthday squared)	1.00*** (-20.32)	1.00*** (-20.45)	1.00*** (-19.60)
<i>Chi square likelihood ratio</i>	2662	2681	2696
N (person months)	219854	219854	219854

Note: Boxes denote comparison across models. All models also include a constant.

* p<.05;
** p<.01;

p<.001, all one-tailed tests

^aReference category is currently living with two married, biological parents.

^bAlso includes dummy controls for whether respondent did not report a mother or father figure during childhood. We tested models without these dummy controls and found no differences to

^cReference category is non-fundamentalist Protestant.

Table 3

Competing Risk Hazard Model Estimates: Relationship Between Family Structure and Contraceptive Use at First Intercourse^a

	Full sample	
	Using Contraception 1	Not Using Contraception 2
Childhood (before age 10)		
Mother was under age 18 at her first birth	1.56*** (5.06)	1.79*** (5.31)
Parents unmarried at birth	1.31** (2.52)	1.01 (0.04)
Family structure (ever lived before age 10)		
Stepparent and one biological parent	1.24 (1.50)	1.97*** (3.19)
One biological parent and his/her cohabiting partner	0.91 (-0.46)	1.38 (1.17)
Single-parent alone	0.94 (-0.59)	1.48** (2.51)
Transitions (ever experienced before age 10)		
Parental divorce	1.16 (1.49)	0.79 (-1.50)
Parental first marriage	0.86 (-1.08)	0.59** (-2.33)
Parental remarriage	0.41*** (-3.17)	0.62 (-1.41)
Number of transitions	1.05 (1.01)	0.95 (-0.65)
Adolescence and Young Adulthood (time varying, previous month)		
Transitions (ever experienced before previous month)		
Parental divorce	0.80 (-0.73)	0.79 (-0.51)
Parental marriage (first or remarriage)	0.73 (-1.59)	1.09 (0.29)
Number of transitions	1.13** (2.33)	1.16* (1.87)
Current family structure (previous month) ^a		
Stepparent and one biological parent	1.35* (2.21)	1.25 (1.07)
One biological parent and his/her cohabiting partner	1.54* (1.88)	0.97 (-0.09)
Single parent with grandparent(s)	1.37 (1.40)	1.93** (2.43)
Single parent alone	1.31** (2.46)	1.08 (0.45)
Other relatives	1.26 (1.06)	1.59* (1.88)
Non-family household	1.07 (0.56)	1.00 (-0.02)
<i>Chi square likelihood ratio</i>	2050	844
N (person months)	219854	219854

Note: Boxes drawn in single lines highlight statistically different effects within race and across competing risks. Boxes drawn in double lines highlight findings also found in multinomial logistic regressions and simple logistic regressions.

^a All models include a constant and all controls shown in Table 2 and described in the text.

* $p < .05$;

** $p < .01$;

*** $p < .001$, all one-tailed tests

Table 4

Competing Risk Hazard Model Estimates: Relationship Between Family Structure and Contraceptive Use at First Intercourse, by Race and Ethnicity^a

	Non-Hispanic Whites Only		Non-Hispanic Blacks Only		Hispanics Only	
	Using Contraception	Not Using Contraception	Using Contraception	Not Using Contraception	Using Contraception	Not Using Contraception
	1	2	3	4	5	6
Childhood (before age 10)						
Mother was under age 18 at her first birth	1.62*** (3.97)	1.89*** (3.35)	1.81*** (3.90)	1.65** (2.84)	1.46 (1.41)	2.21*** (3.64)
Parents unmarried at birth	1.05 (0.26)	1.19 (0.62)	1.39* (2.13)	0.90 (-0.55)	1.75* (1.73)	1.11 (0.35)
Family structure (ever lived before age 10)						
Stepparent and one biological parent	1.33 (1.57)	2.1** (2.34)	1.34 (0.86)	2.05* (1.79)	0.52 (-1.27)	2.05 (1.21)
One biological parent and his/her cohabiting partner	0.78 (-0.98)	1.03 (0.07)	1.78 (1.04)	0.65 (-0.64)	1.03 (0.05)	1.61 (0.74)
Single-parent alone	1.00 (-0.02)	1.53 (1.59)	0.82 (-0.90)	1.76* (2.20)	1.21 (0.6)	1.67 (1.43)
Transitions (ever experienced before age 10)						
Parental divorce	1.14 (1.09)	0.75 (-1.31)	1.28 (1.02)	0.63 (-1.40)	1.12 (0.38)	0.85 (-0.38)
Parental first marriage	0.45 (-1.57)	0.66 (-0.69)	0.43* (-2.11)	0.26* (-2.32)	1.26 (0.47)	0.64 (-0.71)
Parental remarriage	0.80 (-1.23)	0.44** (-2.59)	0.67 (-1.17)	0.62 (-1.20)	0.22 (-1.33)	1.85 (0.9)
Number of transitions	1.10 (1.13)	1.07 (0.49)	0.87 (-1.11)	0.98 (-0.16)	1.04 (0.36)	0.76 (-1.4)
Adolescence and Young Adulthood (time varying, previous month)						
Transitions (ever experienced before previous month)						
Parental divorce	0.86 (-0.42)	1.45 (0.65)	1.34 (0.41)	0.40 (-1.00)		
Parental marriage (first or remarriage)	0.69 (-1.63)	1.24 (0.59)	0.44 (-1.27)	0.74 (-0.41)		
Number of transitions	1.17** (2.54)	1.04 (0.31)	1.21 (1.37)	1.55** (3.00)	0.96 (-0.23)	0.99 (-0.08)
Current family structure (previous month) ^a						
Stepparent and one biological parent	1.13 (0.71)	1.51 (1.34)	1.71* (1.74)	0.98 (-0.07)	2.7* (1.86)	0.99 (-0.01)
One biological parent and his/her cohabiting partner	1.59* (1.70)	0.93 (-0.12)	0.58 (-0.81)	2.00 (1.05)	2.35 (1.17)	0.56 (-0.62)
Single parent with grandparent(s)	1.08 (0.22)	1.82 (1.00)	1.57 (1.38)	1.41 (0.86)	1.02 (0.03)	2.11 (1.51)
Single parent alone	1.15 (0.95)	1.69* (2.03)	1.42 (1.51)	0.64 (-1.64)	1.83* (1.88)	0.8 (-0.64)
Other relatives	1.02 (0.06)	2.61* (1.73)	1.30 (0.83)	0.68 (-1.01)	1.48 (0.56)	2.82* (2.18)
Non-family household	0.98 (-0.14)	1.77* (1.93)	1.17 (0.51)	0.41* (-2.04)	1.81 (1.59)	0.98 (-0.05)
<i>Chi square likelihood ratio</i>	1425	365	463	257	227	210
N (person months)	139290	139290	47680	47680	32884	32884

Note: Boxes drawn in single lines highlight statistically different effects within race and across competing risks.

Boxes drawn in double lines highlight findings also found in multinomial logistic regressions and simple logistic regressions.

^a All models include a constant and all controls shown in Table 2 and described in the text.

* $p < .05$;

** $p < .01$;

*** $p < .001$, all one-tailed tests