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THE EFFECT OF BIRTH ORDER ON AGE AT FIRST SEX AND  
TOTAL NUMBER OF LIFETIME SEXUAL PARTNERS

by

Lacey Christine Clark Anderson  
Bachelor of Arts, University of Northern Colorado, 2009

A Thesis  
Submitted to the Graduate Faculty

of the

University of North Dakota

In partial fulfillment of the requirements

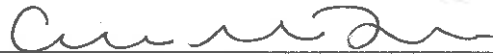
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Master of Arts

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This thesis, submitted by Lacey Clark Anderson in partial fulfillment of the requirements for the Degree of Master of Arts from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done, and is hereby approved.



Dr. Elizabeth Legerski

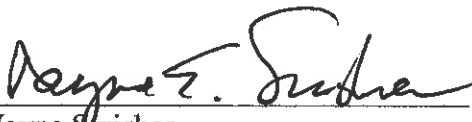


Dr. Krista Lynn Minnotte



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This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the Graduate School at the University of North Dakota and is hereby approved.



Wayne Swisher  
Interim Dean of the Graduate School



April 23, 2013

Title	The Effect of Birth Order on Age at First Sex and Total Number of Lifetime Sexual Partners
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Lacey Clark Anderson  
April 23, 2013

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## ABSTRACT

Research in the field of birth order is expansive and has been used to explain many social processes, including the sexual behavior of young adults. However, results regarding the influence of birth order on risky sexual behavior are somewhat limited, sometimes contradictory, and often lack generalizability to larger populations. In this thesis, using data from the National Health and Social Life Survey (1992) and multiple regression techniques, I investigate the influence of ordinal position on two measures of sexual behavior, age at first sex and total number of lifetime partners, among young adults age 18 to 30. Results show that birth order may have limited influence on some aspects of sexual behavior. Specifically, ordinal position does not significantly influence age at first sex, but does influence total number of partners. The results also show that only children are different from firstborn children in that they report higher numbers of partners and slightly earlier age at first sex. These findings indicate the relevance of including birth order and examining only children and firstborns separately when studying some aspects of young adult sexual behavior.



CHAPTER I  
INTRODUCTION

*Sexual behavior is not only of basic biological importance, but of central social importance. Not only does it perpetuate the human species, but it is the central behavior around which families are formed and defined, a vital aspect of the psychological well-being of individuals, and a component of a variety of social problems.*

– Smith (2006:1)

Sex is complex, captivating, and highly sensationalized in American society. And, as the aforementioned quote by Smith (2006) implies, sex is also a part of normative life. As such, consensual sexual behavior is an integral aspect of the human experience and can help promote positive psychological and physical well-being (Burriss et al. 2010). Excluding instances of forced sex, the resolutions behind sex—at what age to first begin having sex and how many partners with whom to have sex—are typically considered an individual’s choice; however, as with other normative social behaviors, sex is greatly influenced by one’s social milieu, familial background, social statuses, and individual traits.

Using data collected in 1992 for the National Health and Social Life Survey (NHSLs), I investigate the effects of one social and familial force—birth order—on two

indicators of sexual behavior—age at first intercourse and total number of lifetime sexual partners—among young adults aged 18 to 30. Examining the sexual behavior of young adults is important because although there has been a slight decrease in teen sexual activity over the past twenty years (Erickson 1998; Smith 2006; Eaton et al. 2011), young people remain more sexually active than their parents’ or grandparents’ generations. Young adults today tended to have more permissive attitudes toward casual and non-committal sex (Michael et al. 1994) and have sex more often than middle-aged or older adults, as is indicated in vital statistics and health data (Mosher, Chandra and Jones 2005). Research shows that engagement in oral, anal, and vaginal sex peak during this time period (NSSHB 2010), which may be inherent in the physical maturation process that occurs during adolescence and young adulthood (Burriss et al. 2010). Thus, young adulthood provides an intriguing opportunity to study sexual behavior and its determinants.

Although consensual sex may have positive social and psychological effects, some sexual behaviors can also facilitate negative psychological well-being and contribute to a variety of social problems (Smith 2006). Many of the negative outcomes are speculated to be the product of *risky sexual behavior* (RSB), which may include early sexual debut (before age 15), a higher number of sexual partners, failure to use or lower rates of condom or birth control use, non-discriminating sex-partner recruiting patterns, participating in concurrent sex partnerships, and engaging in sexual acts after heavy alcohol consumption (Burriss et al. 2010; Zietsch et al. 2010). Various markers of RSB have been associated with an increased potential for emotional distress in sexually active

young adults, poorer health later in life, greater risk of lifelong poverty, increased risk of contracting a sexually transmitted infection (STI) or experiencing an unplanned pregnancy, along with a higher likelihood of sexual assault victimization and perpetration (Erickson 1998; Rector, Johnson and Noyes 2003; Blanchflower and Oswald 2004; Meier 2007; Abma et al. 2010; CDC 2011; United Nations 2012). Given the wide range of individual and social costs associated with RSB, it is important to understand the causes of such activity.

Because “sexual behavior is a social behavior, determined, shaped, and molded by society” (Michael et al. 1994:5) it is imperative to assess sexual behaviors in a comprehensive way that takes into consideration important social factors. Historically, research on sexual behavior has relied on individual level analysis by investigating the ways in which biological factors, such as mental illness or sex (noting the effect of hormones and genetic factors rather than the social implications of gender), and personal history factors, such as personality, age, education, and income contribute to an individual’s choice to engage in sexual acts. One might presume that if factors such as race, social class, and religious affiliation are shared by siblings reared in a shared family environment, then the sexual behaviors of siblings should be similar. However, as anyone with a sibling can attest, this is often not the case: siblings often display diverse sexual attitudes, sexual orientations, and even sexual behaviors.

In response to these variations, several theories of family dynamics have been proposed that offer suggestions to the mechanisms behind varying levels of sexual behavior within sibling groups. Notably, birth order theory, which addresses both

individual and relationship levels of analysis, has been used to investigate a wide range of human behaviors for over a century. According to birth order theory, the order in which an individual is born into a family can leave an indelible imprint on personality traits, behavioral characteristics, and social bonds, shaping virtually every aspect of that individual's life. The mounting body of literature indicating that birth order influences personality traits, attitudes, and behaviors related to familial and non-familial relationships is staggering, yet significantly less attention has been afforded to examining the influence that birth order has on sexuality, including measures of sexual activity and behavior. In addition, in many analyses only children are excluded or treated like firstborns. Furthermore, much of the literature that does examine how birth order influences sexual behavior uses small, non-random samples, which limit the generalizability of their results.

#### Purpose of This Study

Given the social and individual consequences of risky sexual behavior, the objective of this thesis is to empirically investigate some of the within-family factors and individual traits that may shape the sexual behavior of young adults. Specifically, I ask what are the effects of birth order—measured as ordinal position—on the age at which individuals begin to engage in sexual activity and their total number of sexual partners? Furthermore, what can we learn about the role of birth order in shaping sexual behavior by examining a large, nationally representative sample of young adults ages 18 to 30?

This study enhances the existing literature by examining the correlation between birth order and sexual behavior using the 1992 National Health and Social Life Survey (NHSLs 1992), which gathered data from a large, nationally representative sample of adults. With over 3,400 participants, the NHSLs was the largest and most comprehensive study of sexual behavior since the publication of the Kinsey reports almost half a century before (Kinsey, Pomeroy and Saunders 1948; Kinsey et al. 1953). Although the NHSLs included individuals ages 18 to 59, the current study focuses solely on individuals ages 18 to 30 due to their heightened level of sexual activity and risky behavior. Use of this publically available dataset allows for greater generalizability of results related to the role of birth order on age at first intercourse and number of lifetime sexual partners.

I begin with a broad overview of the sexual behavior literature in Chapter Two, focusing on the attention that has been afforded to age at initiation into sexual intercourse and the total number of lifetime sexual partners. I then provide a discussion of birth order theory and literature. In Chapter Three, I explain the methodology and process of secondary analysis using the NHSLs data. I present the results from linear regression analyses in Chapter Four, and provide a discussion of the results and limitations in Chapter Five.

CHAPTER II  
REVIEW OF LITERATURE

*In private and in public, within our families and among our friends, most of us are living the sexual lives that society has urged upon us.*

– Michael et al. (1994:230)

I begin my investigation of the relationship between birth order and sexual behavior with an examination of sexual trends among young adults. In particular, I focus the examination on two areas of sexual behavior: (1) age at initiation into sexual activity and (2) the total number of lifetime sexual partners. After introducing sexual behavior, I proceed by providing a broad discussion of the literature in the field of birth order theory and research. In the remainder of the chapter I critically review suggested biological, individual, and social influences on sexual behavior. I also define the specific research questions and hypotheses that guide this research.

## Sex in America

Understanding sex is paramount due in part to the reality that specific behaviors, such as an early age of initiation into sexual activity (before age 15) and an increased number of sexual partners, have been shown to have negative health, emotional, and social costs (Stigum, Samuelsen and Traeen 2009; Valle et al. 2009; Scott et al. 2011). Recently, reports of adolescent and young adult sexual behavior have painted an alarming picture of high numbers of unintended pregnancies and increasing occurrences of STIs (Brooks-Gunn and Furstenberg 1989; Weinstock, Berman and Cates 2004; Zimmer-Gembeck and Helfand 2007; Scott et al. 2011). Annually, according to the Centers for Disease Control and Prevention (CDC 2009, 2010a), there are three-quarters of a million pregnancies that occur among women aged 15–19 years, 9.1 million cases of sexually transmitted diseases (STDs) contracted by persons aged 15–24 years, and an estimated 6,610 cases of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) among persons aged 15–24 years. In fact, people aged 15–24 years represent 25 percent of the sexually active population, but acquire nearly half of all new STIs (Eaton et al. 2011). In just a few short years, the estimated annual social cost of these infections rose from \$6.5 billion (Chesson et al. 2004) to over \$15.9 billion (CDC 2008).

Despite “the myth of rampant teenage promiscuity” (Parker-Pope 2009) that is sensationalized in the mass media, studies have shown that adolescent sexual behavior has actually been decreasing over the past two decades in the United States (Erickson 1998; Smith 2006; Eaton et al. 2008). As a matter of fact, in their investigation into the lifelong occurrences of sexual behavior, the authors of the NHSLs were slightly shocked

to find that the majority of participants had no more than “modest amounts of sex with a partner” (Michael et al. 1994:112). Similarly, other data have supported the notion that sexual activity among American youth has been decreasing. Overall, for high school students between 1991 and 2009, a significant decline in adolescent “sexual experience” was observed, resulting in fewer students who reported ever having had sexual intercourse; those who were having sex had sex with fewer partners and were less sexually active in general (Michael et al. 1994). However, the details of these trends vary somewhat between gender and racial categories, and even across studies (Santelli et al. 2000). For example, Eaton et al. (2011) reported decreases in sexual experience among female, male, Caucasian, and African American high school students, but not among Hispanic students.

Although adolescent and young adult sexual behavior is—and has been—on the decline, intercourse is still a common occurrence for many adolescents and young adults. Between 2006 and 2008, 42 to 43 percent of 15- to 19-year-old never-married teenagers reported having engaged in opposite-sex vaginal intercourse at least once (Abma et al. 2010; Eaton et al. 2011). Data from the NHSLS showed that while Americans between the ages of 18 and 30 reported a median number of four sexual partners almost 30 percent of individuals aged 18 to 30 reported more than 11 partners, and 12 percent reported more than 21 partners, and a handful of respondents even reported more than 100 partners (Laumann et al. 1994). Despite the high number of partners for some, 10 percent of the sample reported no partners at all. Thus, regardless of the perceived decline in sexual behavior, because sexual behavior is still so common it is vital to identify and



understand the factors associated with certain forms of RSB, namely age at first intercourse and total number of lifetime sexual partners.

With all the uncertainty and myths that surround sex, gaining an accurate understanding of sexual behaviors can prove difficult. While biological factors such as physiology, maturation, and aging may shape sexual expression, sexual behavior is also fundamentally structured by social factors. It is well established that familial characteristics influence sexual decision-making (East 1993; Sieving, McNeeley and Blum 2000; Wu and Thompson 2001; Cooksey, Mott and Neubauer 2002; Cheng and Landale 2011); however, understanding the ways in which families matter is complex. Gonzalez and Dodge (2010:2) offered eloquently written insight into the role of the family in shaping how peer influences function:

Considerable evidence suggests that family and peer contexts provide the proximal nexus at which genetic and many other social-contextual factors converge to produce risk-taking behavior in adolescence. The bulk of adolescent risky behavior...occurs in peer groups. However, the family provides the developmental foundation (or deficiencies) in social and emotional skills and values that, in turn, influence adolescents' selection or association with peers that ultimately determine whether they initiate, escalate and persist with these behaviors.

Indeed, a deeper analysis of the ways in which the family constellation shapes sexual behavior is needed. Thus, in this analysis I focus on birth order, a family-based factor that

has been suggested to be particularly important in shaping young adult sexual attitudes, desires, and behavior.

### Birth Order Theory

*Birth order* is a broad umbrella term used to denote several distinct operationalizations including *serial birth order* in which the numerical rank of the child is used (1<sup>st</sup> born, 2<sup>nd</sup> born, ... 9<sup>th</sup> born, and so on), *ordinal position* (only child, firstborn, middleborn, and lastborn), and a dichotomous categorization of *firstborns* and *laterborns* (whereby all siblings other than the firstborn are analyzed as one group and only children are often considered firstborns). In addition, only children are sometimes excluded from analyses as some researchers have argued that the lack of siblings negates any influence birth order has on individuals, while others have asserted that only children provide a valuable comparison group when studying birth order. Regardless of the way birth order is operationalized, the main premise underlying birth order theory is that the order in which an individual is born into a family influences their personality, attitudes, beliefs, behaviors and social interactions over the entirety of their life-course (Sulloway 1996; Hartshorne et al. 2009).

From its inception, birth order theory has been utilized in attempts to explain differences among siblings within both biological and constructed sibling structures (such as instances of adoption or blended families), focusing on the role of the family—parents and siblings alike—on developing sibling differences. It is well documented that the family is the primary agent of socialization, providing care in early stages of a child's

life, imparting knowledge and skills to them, and overall greatly contributing to their sense of social identity. Further, the family also provides the child a social position in terms of race, ethnicity, social class, religion, and geographic location, all of which influence their self-concept (Macionis 2006). According to Wallace (1999:5), the family environment and specifically the relationship between siblings lends heavily to the development of social relationships: “it is through this relationship that children receive their first lessons about how to love a peer, how to share, and how to empathize with others—skills that are then transferred to the world at large.” Yet, siblings reared in the same environment may display such diverse personalities, attitudes, and beliefs, forcing some researchers to ponder explanations for these variations. Investigations into the role of birth order aim to address these nuances.

### *History of Birth Order Theory*

In 1874 Darwin’s cousin, Sir Francis Galton, made the first observation that the order in which a person is born into their family may impact their lifetime achievement status by noting the overrepresentation of firstborns and only children among scientists at the Royal Society (Hartshorne et al. 2009; Geil and Petelle 2012). Although Galton did not fully understand the role of birth order, he surmised there was something about a firstborn son’s ability to be more independent and freer to follow his interests compared to his siblings that most likely contributed to his success. His initial observations ignited scientific interest in the speculation that siblings’ positions relative to each other would influence their outcomes, an interest that has lasted for over a hundred years.

Galton's observation is often attributed as the first investigation into birth order, but it wasn't until 1928 that a more discernible theoretical field emerged, put forth by Alfred Adler, an Austrian psychologist. Adler posited that during childhood, each child is aware of their position in the family (e.g. who is their parents' favorite, which sibling is smarter, which child is babied). Accordingly, this perception of one's place relative to their siblings leaves lasting impressions on their personality, affecting the ways in which they approach tasks of friendship, love, and work. Adler concluded that each child adapts diverse personality styles in an effort to attain more parental investment, a process he labeled "niche finding" (Sulloway 2001:15).

Adler's birth order theory has inspired a wide range of birth order studies over the years. This body of empirical evidence shows that firstborns score higher on measures of intelligence, tend to be more successful, motivated, and reliable, and are more likely to go to college or become leaders (Dattner 2008; Sulloway 1997; Leman 2009). Oldest children are also more likely to conform to parental values, and to obey authority figures; further, they typically rank high in conservative religious and political beliefs (Sulloway 1996; Dattner 2008). Although firstborns report higher levels of self-esteem and self-pride they may sometimes feel pressured to impress their parents and set a positive example for their younger siblings resulting in a higher rate of emotional and psychological illnesses than laterborns (Ickes and Turner 1983; Kirkcaldy, Furnham and Siefen 2009; McGuirk and Pettijohn 2008).

Although some contemporary researchers disregard only children, arguing that the lack of siblings negates an influence of birth order (e.g. Touhey 1971a), others argue that

the role of the only child is important in understanding differential socialization within the family (Sulloway 1996; Mancillas 2006). Adler explained that the only child is much like the firstborn child but without the experience of "dethroning" from the birth of a sibling. Some argue that only children are more likely to develop an exaggerated sense of superiority, believe that the world is dangerous (Hergenhahn and Olson 2003:117), and experience dethroning later, most likely in school, when they learn that their position as center of attention can be taken by other children (Sulloway 1998; Leman 2009).

Like firstborns, lastborn children also report high levels of self-esteem, but are considered more spoiled as the "baby of the family," which may in turn lead to lower rates of ambition later in life. As a bi-product of having older siblings take care of younger siblings, some theorists have suggested that lastborns tend to invest less in their relationships than do people in other birth order categories (Wallace 1999; Cane 2008).

On the other hand, middleborns, stuck between older siblings and the baby of the family, often report feeling overlooked and ignored, and express higher levels of depression and loneliness (Leman 2009). Leman asserts that being social and competitive are ways for middleborn children, who often look to non-familial relationships, to find acceptance, recognition, and belonging. Due to a strong need for love and acceptance, or possibly fear of confrontation, middleborns may be less likely to say no to others' requests (Wallace 1999), tend to be more agreeable, highly loyal to their peer group, and to have many friends (Sulloway 1996; Cane 2008). Taken together, findings such as these suggest that the effects of birth order go beyond individual traits by influencing interpersonal relationship styles. Because middleborns and lastborns employ different

personality strategies as an attempt to garner parental attention, these differential personality characteristics may affect sexual strategies in much the same fashion (Michalski and Shackelford 2002).

### *Birth Order and Sexual Activity*

Researchers have asserted that coupled with individual traits, family dynamics influence sexual attitudes and behaviors (Weinstein and Thornton 1989). Birth order is one component of family composition that shapes personality and socialization, but research in the area of sexual activity has produced a variety of competing findings. For example, while some research has shown both male and female firstborns were more likely to report premarital sexual activity (Touhey 1971a; Horn and Turner 1975) and a greater number of partners (Michaleski and Shackelford 2002), other research has shown that laterborns are more likely to engaging in sexual activity (Argys et al. 2006), report earlier initiation into sexual activity (Dixon 1980; Rodgers, Rowe and Harris 1992) and have sex more frequently, although not necessarily with more partners (Rodgers and Rowe 1988; East 1996).

At the individual trait level, some argue that it is the differential personality characteristics of firstborns and laterborns that shape differences in sexual behavior by birth order. For example, using a dichotomous operationalization of birth order, Michaleski and Shackelford (2002) hypothesized that laterborns would engage in short-term sexual strategies, invest less in romantic partners, and actively pursue casual sex partners. Firstborns, on the other hand, would display a willingness to invest time,

energy, and resources in a romantic partner, seeking and having fewer sex partners by employing longer-term sexual strategies. But when they compared the sexual desires and behaviors of firstborns and laterborns, among a sample of 400 college students, they found that contrary to their hypothesis, firstborns actually reported a significantly higher number of previous sexual partners (almost twice as many) as laterborns. Yet, perhaps consistent with their hypothesis, they also found that firstborns desired fewer partners in the future and planned to have children at a younger age than did laterborns.

On the family interaction level, birth order theory suggests that older siblings may act as persons of reference for younger siblings, influencing the timing of younger siblings' initiation into sexual activity. For example, some argue that the greater probability of intercourse for laterborn males and females illustrates how the sexual behaviors and attitudes of older siblings shape the behaviors of their younger siblings (Argys et al. 2006). In support of this notion, East (1996) noted that older sisters' adolescent childbearing status influenced the sexual attitudes and behaviors of their younger sisters, and Widmer (1997) provided evidence that the sexual behaviors of older brothers also had a strong effect on younger siblings' behaviors, noting that, "[w]hen older brothers have not yet initiated sex, younger siblings of both genders have a significantly lower chance of having initiated sexual activity, as well" (p. 933). Nevertheless, scholars, such as Bane, Cabatu and Devers (2008), argue that the *existence* of a sibling may be more predictive of girls' sexual activity than the actual *behavior* of the older siblings.

Whether birth order shapes individual personality traits or socialization among siblings, the consistent finding of significant differences between firstborns and laterborns in sexual activity suggests that the birth order of a child should be taken into consideration when studying the factors that shape young adult sexual behavior. Despite the importance of the findings summarized above, many of these analyses use small, non-random samples which limit the generalizability of their results (e.g. Touhey 1971; Dixon 1980; Rodgers and Rowe 1988; Billingham et al. 1989; Rodgers et al. 1992; Widmer 1997; Salmon and Daly 1998; Draper and Hames 2000; Salmon 2002). One is left wondering if the effects of birth order are observable among larger samples and what we might learn about the role of birth order in shaping sexuality by examining a nationally representative sample of young adults. Are there statistically significant differences in age at first intercourse and number of sexual partners by birth order? What is the role of birth order in shaping age at first intercourse and number of sexual partners among young adults? Although differences in age at first intercourse have been observed by some, there has been less research regarding the role of birth order in shaping the number of sexual partners among young adults. In many analyses only children are excluded or treated the same as firstborns and the findings have produced a variety of results.

### Research Questions and Hypotheses

Based on gaps and disagreements in previous literature regarding the role of birth order in shaping sexual behavior and a lack of generalizable analyses, I explore birth order—operationalized as ordinal position—in relation to (1) the age at first sexual



activity, and (2) the total number of lifetime sexual partners among a large, representative sample of young adults aged 18 to 30. Specifically, I ask does birth order predict age at first sex for young adults? Further, does birth order have an effect on the total number of lifetime sexual partners for young adults? Based on previous literature, I propose the following hypotheses:

H<sub>1</sub>: Laterborns (middleborn and lastborn) will initiate sexual activity at an earlier age than will firstborn or only children (who will have similar initiation into sexual activity).

H<sub>2</sub>: Laterborns (middleborn and lastborn) will report more sexual partners than will firstborns or only children (who will have similar numbers of sexual partners).

#### *Additional Variables Associated with Birth Order*

Although birth order may be important in shaping sexual behavior, previous research indicates that other demographic factors such as respondent's age (Laumann, Paik Rosen 1999; Smith 2006; Stigum et al. 2010), gender (Smith 2006), race and ethnicity (Michaleski and Shackelford 2002; Zimmer-Gembeck and Helfand 2007), level of education (Collins et al. 2004), religiosity (Smith 2006; Burdette and Hill 2009), and political preference (Goodson, Evans and Edmundson 1997) also influence sexual behavior. For example, in a meta-analysis examining 35 longitudinal studies of adolescents' initiation into sexual intercourse, Zimmer-Gembeck and Helfand (2007) found that individual level factors such as gender, age, race and ethnicity were significant factors in determining age at first heterosexual onset of sexual activity. Research has also

noted that variables related to the family environment are influential as well, including the educational level of the respondent's parents, family living situation, and parents' values system (i.e., liberal compared to conservative) (Haurin and Mott 1990; Whitbeck 1999; Collins et al. 2004; Smith 2006; Pollett and Nettle 2009). Birth order researchers have added that the number of siblings in a family, commonly known as *sibship size* or *sibship* (Rodgers et al. 2000), are also an important component of the family environment and may also influence the effect of birth order. Given the importance placed on these variables in affecting sexual behavior, I briefly discuss literature pertaining to these factors below and include them in the current study's analyses as control variables.

#### *Age of Respondent*

The older a person is, the more opportunities they have to acquire sexual partners, thus age has been shown to be related to sexual behavior and is often used as a control variable in sexual behavior research (e.g. Lalor, O'Regan and Quinlan 2002; Bersamin et al. 2006; Lindau et al. 2007; Kan et al. 2010). Young Americans ages 18 to 30 are of particular interest in this analysis due to the higher likelihood of sexual activity (Mosher et al. 2005) and singlehood (Goodwin 2002) compared to older cohorts. Given the importance of age in shaping opportunities for sex and cultural norms surrounding sexual behavior, it is important to include it in analyses.

## *Gender*

According to sex researchers (Johnson 2004; Smith 2006; Lindau et al. 2007) and birth order researchers (Phillips, Long and Bedeian 1990; Marjoribanks 1997) alike, gender may also influence sexual behavior.<sup>1</sup> In fact, much of the literature on sexual behavior includes sex or gender as a predictive variable. For instance, research shows that rates of engagement in oral sex and intercourse (Bersamin et al. 2006; Lindau et al. 2007; Sneed 2009; Abma et al. 2010), condom usage (Santelli et al. 2000; Mosher et al. 2005; Atkins 2008), and solitary sex (Oliver and Hyde 1993; Das 2007) vary between females and males. For example, female adolescents are more likely to engage in oral sex than are their male counterparts (Bersamin et al. 2006); however, male adolescents are more likely to affirm intentions to engage in oral sex in the next six months than are female adolescents (Halpern-Felsher et al. 2005). Males are also more likely to report contraceptive usage than are females (Guttmacher Institute 2011), and almost twice as many adult men engage in solitary sex than do women (Oliver and Hyde 1993; Das 2007), a difference that has remained relatively unchanged since the Kinsey era.

Along the same lines, age at first intercourse and the total number of sexual partners are both highly gendered (Oliver and Hyde 1996; Paul et al. 2000; Taylor 2005; Smith 2006; Zimmer-Gembeck and Helfand 2007; CDC 2008; Sneed 2009). According to the Guttmacher Institute (2002), men initiate sexual intercourse at an average age of 16.9 years while women are slightly later at 17.4 years on average. Additionally,

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<sup>1</sup>While the literature often uses the term “sex,” I use “gender” due to the methods used to collect data for this study. While sex refers to biological elements, such as hormones, chromosomes, and genitals (Laqueur 1990; Fausto-Sterling 2000), gender is a social system that includes a person’s presentation of self. Gender is conveyed through gestures, linguistic nuances, and a combination of emotional and physical characteristics (Lorber 1994). In the NHLS, researchers used their own judgment to identify the “sex” of respondents, which implies gender, not sex. I also acknowledge that a dichotomous operationalization of gender is exclusionary; nevertheless, a binary definition of female/male gender is used here.

American men report having an average of six to eight life-time sexual partners with whom they have had vaginal, anal, or oral sex, whereas women report an average of four partners (Paul et al. 2002). Nevertheless, 68 percent of males and 70 percent of women report having had vaginal sex with a person of the opposite-sex by the age of twenty-four (Mosher, Chandra and Jones 2005). Even in 1992, gendered differences in sexual behavior were quite large. Laumann et al. (1994) found that men were more likely to report having had several partners and were significantly less likely to report having no partners at all. In fact, “cumulated over the lifetime, these differences by gender are quite large—over half the men but only about 30 percent of the women report having had five or more sex partners since turning eighteen” (p. 184). Given these findings, gender ought to be included in any analysis of the effects of birth order on sexual behavior.

### *Race and Ethnicity*

Previous research has also frequently noted ethno-racial patterns of sexual behavior (e.g. Smith 1998, 2006; Laumann, Paik and Rosen 1999; Santelli et al. 2000; Wu and Thompson 2001; Cooksey 2002). More specifically, research has shown that African American and Hispanic individuals, particularly males, tend to have an earlier sexual debut (Moore et al. 1995; Upchurch et al. 1998; Cooksey 2002; Mosher et al. 2005) and a higher number of sexual partners (Bakken and Winter 2002; Smith 2006). Additionally, African American and Hispanic teenagers and adults were less likely to report condom usage (Eaton 2011), and to report higher rates of STIs or HIV/AIDS

(Laumann and Youm 1999; Mocello, Samuel and Smith 2008; CDC 2010) than their White and Asian American counterparts.

Although some have theorized that race must be taken into consideration when evaluating the influence of birth order, analyses examining race/ethnicity and birth order have produced results which were either non-significant or were unclear concerning the interaction between race/ethnicity and birth order (e.g. Widmer 1997; Herrera et al. 2003; Kantarevic and Mechoulan 2006; Geil and Petell 2012). It has also been hypothesized that family structures typical of some racial minority groups may influence sexual behavior; for instance, Wu and Thompson (2001) investigated the influence that race and the number of siblings would have on sexual debut. However, no clear direct correlation between the two variables was found in their study. Regardless, race and ethnicity are included in this study as a control variable.

### *Level of Education*

Education may also play a role in influencing sexual behaviors. Previous researchers have suggested that the educational level of the respondent and the respondent's parents affect sexual attitudes and behaviors. A meta-analysis (Goodson, Evans and Edmundson 1997) using data from 1984 to 1994 found that respondent's educational expectations were shown to be negatively correlated with onset of sexual activity, suggesting that the desire for higher educational attainment also increased the respondent's age at first sexual activity. Additionally, a study conducted in 2008 showed that in the six months following high school graduation, college attendees—compared to

non-college attendees—were less likely to report casual sex and more likely to report consistent condom use when they did engage in sex (Bailey et al. 2008). In addition to the education level of respondents, research has also shown that parental education is related to sexual behavior. Specifically, studies have shown that higher levels of parental education act as a protective factor against RSB in young adults, lowering the age at first onset and frequency of sexual activity (Small et al. 1994; Collins et al. 2004). In light of these previous findings, I include the education level of both the respondent and the respondent's father to control for the influence of education on sexual behavior.

### *Religiosity*

Research shows that religiosity may also shape sexual behavior, including age at sexual debut and total number of partners (Sigalow et al. 2012; Smith 2006). Firstborns are more likely to be religiously conservative while middleborns and only children are more likely to be liberal, factors which are well known to influence sexual behavior (Bearman and Brückner 2001; Gold 2010). Research has shown that religious beliefs influenced the decision to remain abstinent prior to marriage for females and males (Helm et al. 2009) and the tendency to engage in risky sexual behaviors, such as early onset of sexual debut or multiple premarital sexual partners in young adults (Nonnemaker, McNeely and Blum 2003; Rostosky et al. 2003; Davidson 2008; Barnett et al. 2009). Perhaps surprisingly, studies show little difference in sexual behavior that can be directly attributed to religious denomination (Laumann et al. 1994; Earle et al. 2007; Gold 2008). Yet, while the impact of denomination may be minimal, the impact of

religious activity is not. In fact, religiosity, commonly measured by the frequency one attends religious services, has been found to be a more precise predictor of sexual behavior (Nonnemaker et al. 2003; Gold et al. 2010) than religious denomination. For example, the frequency of church attendance has been found to be negatively correlated with ever having had sex (Davidson et al. 2004; Earle et al. 2007). Frequency of attendance has also been linked to the age at sexual debut (Bassett et al. 2002; Meier 2003; Burdette and Hill 2009) and number of sexual partners (Rostosky et al. 2003; Gold et al. 2008; Christopher and Sprecher 2000; Earle et al. 2007; Hull et al. 2011). Because of the strong influence religiosity has on sexual behaviors, it is necessary to control for the effects of religiosity on sexual behavior.

### *Political Preference*

Political preference is also closely related to religious affiliation and attitudes about sexual behavior. For example, research shows that conservative political values are positively associated with age at first onset of sexual activity, acting as a protective factor against early sexual initiation (Goodson et al. 1997). Thus, political preference is an important variable to include when studying sexual behavior.

### *Two-Parent Household*

Similar to the protective factors associated parent's educational level and political conservatism, living with two-parents has also been shown to influence young adults' sexual activity (Laumann et al. 1994; Michael et al. 1994). In particular, two-parent

households potentially offer closer parent-child monitoring, a factor also associated with lower RSBs, including fewer number of partners and a later sexual debut (Kotchick et al. 2001).

### *Sibship Size*

Finally, while birth order may be a significant predictor of sexual behavior, researchers often caution that confounding family environment variables may influence direct effects attributed to birth order. Those who support this argument often afford specific attention to a variable that measures the number of siblings in the home, referred to as *sibship size* (Sulloway 1996, 1998; Riggio 2006). According to Pollet and Nettle (2009) there is a high likelihood in larger families of categorizing individuals as middleborns or laterborns than in smaller families. Thus, this disproportionality may dilute or exaggerate the role of birth order in predicting sexual behavior. In research similar to the current study, sibship size is included to address the influence of the social environment and family structure. For example, Haurin and Mott (1990:539) explain that less parent-child interaction exists in larger families. Older siblings may even take on the role of parent for their younger siblings, thus positioning them to disproportionately influence their younger siblings' behavior.

### Summary

In this chapter I described the extent of sexual activity and RSB among young adults. I provided a history of birth order theory and the pertinent literature related to



sexual behavior was also reviewed, followed by a discussion of other important control variables used in birth order research. In the next chapter, I explore the process of secondary analysis of the NHLS data and outline the methodology used in this investigation.

## CHAPTER III

### METHODS

This chapter discusses the methodology employed throughout this research project. First, I offer a description of the National Health and Social Life Survey (NHSLs 1992) research project, data sampling techniques, and survey instrument. A brief narrative of the sample participants is given, followed by an outline of the selected variables and their operationalization. I then describe the statistical analyses and analytical techniques used to answer the research questions.

#### The National Health and Social Life Survey

The data for this study were taken from the National Health and Social Life Survey (NHSLs), which was collected through the Survey Research Center-National Opinion Research Center (SRC-NORC) at the University of Chicago. The NHSLs was the largest comprehensive national study of sexual behavior since the publication of the Kinsey reports almost half a century before (Kinsey et al. 1948; Kinsey et al. 1953). It was a variation of the larger Survey of Health and AIDS-Related Practices (SHARP), which was never completed due to political and bureaucratic complications (Miller 1995). After the collapse of the SHARP project, private-sector funding was obtained and, despite ongoing political controversy, the research team was able to continue. Eventually

a truncated version of the study was published that became the NHSLs. A more detailed account of the research design can be found in Miller (1995) or Michael (2000).

According to the study's abstract available on the NHSLs website (<http://popcenter.uchicago.edu/data/nhsls.shtml>), the aim of the NHSLs was to collect data concerning "the organization of sexual behavior, particularly the social structuring of sexual action, and the ways in which that structure influences behaviors that increase the incidence and prevalence of a variety of health-related problems." One particularly important objective of the NHSLs was to uncover patterns of sexual behavior in relation to changes over the life-course, a project not previously undertaken at a national level.

### *Research Design and Sampling Methods*

The sampling design and methodology of the NHSLs makes the study generalizable to the larger American population, an aspect that is lacking in many previous birth order and sexual behavior studies (e.g., Touhey 1971a; Rodgers and Rowe 1988; Rodgers et al. 1992; Salmon 2002). NHSLs (1992) participants were chosen using a three stage random probability sample of the English-speaking United States population. Following normative area-probability methodology similar to the 1980 SRC-NORC sample frame (Laumann et al. 1994), the U.S. was separated into geographic regions of equal population size. These regions were divided into eighty-four smaller geographic regions or "strata." Random probability sampling produced clusters of households within these strata, giving every household within each stratum an equal chance of being selected. Finally, one English-speaking adult between the ages of 18 and

59 was randomly selected from each household to participate in the survey. Of the 4,168 individuals who were selected for inclusion in the study, 736 (17%) refused to participate, for a total of an 83 percent response rate. If the selected individual refused to participate, another resident in the household was not substituted. The final sample included a total of 3,432 English-speaking adults, aged 18 to 59. Interviews with respondents were conducted between February and September 1992.

### *NHSLs Instrument*

The data were collected using both a face-to-face questionnaire administered by a trained NORC employee and four self-administered questionnaires (SAQs). The four SAQs were proctored during a ninety-minute interview and returned to the interviewer in a sealed “privacy envelope” as an attempt to encourage respondent candidness, increase response reliability and validity, ensure respondent privacy, and improve overall quality of data obtained (Couper and Stinson 1999; Kim et al. 2010).

The face-to-face questionnaire included the direct reading of both open- and close-ended questions by the interviewer who recorded the respondent’s answers on the questionnaire form. In addition to the quantitative nature of questionnaires, the face-to-face questionnaires added both depth and complexity to the survey process, allowing the interviewer to probe for further qualitative information when necessary. To gather information about patterns of sexual behavior over the respondent’s lifecourse, data were recorded in chronological order. This sequencing allowed for discussion of specific instances of their sexual activity at each life stage. After identifying information was

removed, responses from the SAQ and face-to-face questionnaires were compiled into the publicly available dataset.<sup>2</sup> The current study focuses on a sub-sample of the larger NHLS data set, selecting only individuals aged 18 to 30 who reported sexual behavior ( $n = 1081$ ) for analysis since younger cohorts are more likely to be sexually active, have more partners, and engage in riskier sexual behavior than older cohorts. Furthermore, the behavior of this cohort is more likely to shape the behavior of subsequent generations, highlighting the importance of gaining a better understanding of sexual behavior.

## Measures

### *Dependent Variables*

#### *Age at First Sex*

To investigate the relationship between birth order and sexual behavior, I began by analyzing age at first sexual intercourse. The NHLS included two separate items that reported age at first vaginal intercourse with an opposite-sex partner and age at first sex with a same-sex partner. Since I was interested in age at first consensual sexual intercourse regardless of the sex of the partner, I created a new variable, *age at first sex*, which represents the age at first engagement in *any* consensual sexual intercourse.

Respondents who reported no lifetime sexual activity were not included in this analysis.

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<sup>2</sup> For further discussion of this instrument, instrument validity, and study design refer to Couper and Stinson (1999), Michael et al. (1994), and Miller (1995). For a copy of the full NHLS questionnaire, see Laumann et al. (1994:Appendix C).

### *Total Number of Partners*

Continuing from the responses given for first sex, the NHSLS interviewer inquired about the total number of opposite-sex and same-sex partners (other than the first person with whom they had sex) before age 18. In a separate question respondents were asked about the total number of sexual partners since the age of 18. Using this information, I created a new variable, *total number of partners*, which measures the total number of partners with whom the respondents had sex, including the first partner, over the respondent's lifetime.

### *Independent Variables*

#### *Ordinal Position*

The primary independent variable in my analysis is *ordinal position*, a common operationalization of birth order (Hartshorne et al. 2009; Lohman et al. 1985; Herrera et al. 2003), where individuals are categorized as only children if they do not have siblings or firstborn, middleborn, or lastborn if they have siblings. To measure birth order, the NHSLS included an item which asked respondents to identify themselves as either an oldest child, youngest child, or born in the middle. Following coding schemes similar to Haurin and Mott (1990), Michalski and Shackelford (2002), and Argys et al. (2006), I recoded the values assigned to birth order so that lower numerical values were assigned to earlier chronological birth positions. Specifically, an oldest child was coded as (1), a middle child was coded as (2), and a youngest child was coded as (3). Unfortunately, the NHSLS face-to-face questionnaire did not specify a response for only children. To

account for this ordinal position, the value (0) was assigned to respondents who reported zero siblings and no sibling order.

### *Control Variables*

#### *Age of Respondent*

The *age of respondents* was not explicitly asked in the interview or in the questionnaire. The variable for the respondent's age at the time of the NHSLS interview was calculated from the respondent's date of birth and the date of the interview, and is measured in years.

#### *Gender*

The NHSLS SAQ did not have an item that queried respondent sex or gender; instead, this measure was recorded by the interviewer. Respondents whom the interviewer perceived as male were coded as (0), and those who were perceived as female were coded as (1).

#### *Race and Ethnicity*

Following Census standards, the NHSLS recorded racial identification and Hispanic ethnicity separately. The final dataset included a race/ethnicity variable that combined the responses from these two questions. For analysis, I created a series of dummy variables to measure race in which I separated *White* (1) from non-White (0), *Black* (1) from non-Black (0), *Hispanic* (1) from non-Hispanic (0) and then all *Other*

*race* categories (1) from non-Other (0). The *Other race* category was used as the comparison group in the regression analyses.

### *Level of Education*

To measure the influence of education on sexual behavior, two variables were included in the analysis. First, the *respondent's education* was measured as an ordinal variable in which the following values were assigned: Less than 12<sup>th</sup> grade (1), High school graduate (2), Some vocational/trade/ or business school (3), College graduate (4), and More than a college degree (5). Next, the *respondent's father's education* was also included where the response categories included: Grade eight or less (1), High school graduate (2), Finished high school or equivalent (3), Some vocational/trade/ or business school (4), Some college or two-year degree (5), Finished 4-5 year degree (6), Master's degree or equivalent (7), and Other advanced degree (8).

### *Religiosity*

*Religiosity* was measured by inquiring about how often the respondent attended religious services. The close-ended responses are as follows: Never (0), Less than once a year (1), About once or twice a year (2), Several times a year (3), About once a month (4), Two to three times a month (5), and Nearly every week (6).



### *Political Preference*

Political preference was included in the NHSLS, allowing respondents to select one of the following categories: Republican, Democrat, Independent but close to Republican, Independent but close to Democrat, Independent, other but close to Republican, other but close to Democrat, other, no preference but close to Republican, no preference but close to Democrat, and no preference. For this analysis, political preference was recoded as two dichotomous dummy variables where *Republicans* were coded as (1) to include those who reported they were either Republican, Independent but close to Republican, other but close to Republican, or no preference but close to Republican and everyone else was coded as (0). For the second political preference dummy variable, *Democrats* were coded as (1) to include those who reported they were either Democrat, Independent but close to Democrat, other but close to Democrat, or no preference but close to Democrat and everyone else was coded as (0).

### *Two-Parent Household*

Family living situation at age 14 was included as a way to assess the influence of living situation during adolescence on sexual behavior. The original NHSLS survey queried whether the respondent lived with both their own mother and father, father and step-mother, mother and step-father, father but no mother or step-mother, mother but no father or step-father, other male relative, other female relative, other arrangement with both female and male relatives, or other. For use in this analysis, I created a dichotomous variable to represent whether the respondent lived in a *two-parent household* or not at age

14. Those who indicated they lived with both their own mother and father, father and step-mother, or mother and step-father were coded as (1). All other values were coded as (0) as they were not indicative of a “typical” two-parent household.

### *Sibship*

The NHSLS queried respondents concerning the number of siblings they had, including those born alive, but no longer living, as well as those alive now. The respondents were also instructed to include step- and adopted siblings. Respondents were asked to report their number of brothers and number of sisters separately. Unfortunately, the NHSLS collapsed responses of six or more brothers or sisters into a single category. To measure the total number of siblings a respondent had, I combined the responses for number of brothers and sisters, indicating the respondents’ total *sibship*. Any respondent whose total *sibship* was greater than five was collapsed into a single category representing six or more siblings.

### Data Analysis Procedures

To analyze the hypothesized relationship between birth order and sexual behavior a series of multiple regression models were constructed using the data processing program SPSS 20.

### *Age at First Sex*

The first part of the research question asks, does birth order predict age at first sex? In order to determine if middleborns or lastborns will initiate sexual activity at an

earlier age than firstborns or only children, two OLS multiple regression analyses were conducted. The first regression model predicted *age at first sex* using only the *ordinal position* variables. The second multiple regression analysis investigated *age at first sex* using the *ordinal position* variables but also included several control variables: *age, gender, race and ethnicity, religiosity, sibship size, political preference, respondent's education, father's education, and two-parent household* at age 14. Using a series of models like this allowed me to determine whether the relationship between *birth order* and *age at first sex* was robust once controlling for the other variables.

#### *Total Number of Sexual Partners*

The second part of the research question asks, does birth order predict number of sexual partners? In order to determine if middleborns or lastborns will have more sexual partners than firstborns or only children, I conducted an analysis similar to the previous with the exception that the focus was on the effect birth order has on the total number of lifetime sexual partners. The first regression model predicted *number of sexual partners* using only the *ordinal position* variables. The second multiple regression analysis investigated *number of sexual partners* using *ordinal position* as well, but also included several control variables: *age, gender, race and ethnicity, religiosity, sibship size, political preference, respondent's education, father's education, and two-parent household* at age 14. Once again, using a series of nested models allowed me to determine whether including other control variables changed the relationship between *birth order* and *number of sexual partners*.

## Summary

In this chapter I detailed the methods used in this investigation including the operationalization of the variables I examined and the statistical analyses I conducted. Descriptive statistics and the results of these statistical analyses are presented in the following chapter, followed by a detailed discussion of the findings in Chapter Five.

## CHAPTER IV

### RESULTS

This study was conducted to investigate the hypothesized effect that *birth order* has on sexual behavior for adults between the ages of 18 and 30 using two measures of sexual behavior: *age at first sex* and *total number of sexual partners*. The research questions that guided the research were: (1) is birth order a significant predictor of age at first sex? and (2) does birth order have an effect on the total number of lifetime partners with whom an individual has sex among a representative sample of U.S. young adults? I first provide descriptive statistics for variables used in this study, followed by results from the multiple regression analyses.

#### Descriptive Statistics

Table 1 summarizes descriptive statistics for each of the variables used in this study. The final sub-sample used in this study included 1081 respondents, with a mean age of 25 years ( $SD = 3.49$ ). The sample was roughly balanced between female (54.4%) and male (45.6%) participants. Racially, the majority of the sample self-identified as non-Hispanic White (68.4%); roughly 16.2 percent identified as non-Hispanic Black, and 11.6 percent identified as Hispanic (of any race). Less than 4.0 percent identified as another race. Overall, the sample was well educated; 29.0 percent received a high school

diploma, 37.5 percent received at least some college or vocational training, and 18.5 percent received a college degree or other advanced degree. The mean for religiosity was

**Table 1: Descriptive Statistics (N= 1081)**

<i>Variables</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
<u>Dependent Variables</u>			
Age at first sex	16.93	2.53	12 – 28
Total number of partners	9.22	15.73	1 – 181
<u>Birth Order – Ordinal Position</u>			
Only child	.04		
Firstborn	.26		
Middleborn	.38		
Lastborn	.32		
<u>Control Variables</u>			
Age	25.00	3.48	18 – 30
Gender <sup>a</sup>	.54		
Religiosity <sup>b</sup>	3.32	2.43	0 – 8
Education (respondent) <sup>c</sup>	2.63	1.02	1 – 5
Father's education <sup>d</sup>	3.73	2.03	1 – 8
Democrat <sup>e</sup>	.40		
Republican <sup>f</sup>	.40		
White <sup>g</sup>	.68		
Black <sup>h</sup>	.16		
Hispanic <sup>i</sup>	.12		
Other Race <sup>j</sup>	.04		
Two-parent household <sup>k</sup>	.77		
Sibship <sup>l</sup>	3.34	1.81	0 – 6

<sup>a</sup> 0 = female, 1 = male.

<sup>b</sup> 0 = never, 1 = less than once a year, 2 = one or two times a year, 3 = several times a year, 4 = about once a month, 5 = two to three times a month, 6 = nearly every week, 7 = every week, 8 = several times a week.

<sup>c</sup> 1 = less than 12<sup>th</sup> grade, 2 = high school grad, 3 = some vocational/trade/ or business school, 4 = college graduate, 5 = more than college degree.

<sup>d</sup> 1 = grade eight or less, 2 = high school grad, 3 = finished high school or equivalent, 4 = some vocational/trade/ or business school, 5 = some college or two-year degree, 6 = Finished 4-5 year degree, 7 = Masters or equivalent, and 8 = other advanced degree.

<sup>e</sup> 0 = non-democrat, 1 = democrat.

<sup>f</sup> 0 = non-republican, 1 = republican.

<sup>g</sup> 0 = non-White, 1 = White.

<sup>h</sup> 0 = non-Black, 1 = Black.

<sup>i</sup> 0 = non- Hispanic, 1 = Hispanic.

<sup>j</sup> 0 = non- Other Race, 1 = Other Race.

<sup>k</sup> 0 = non-two-parent household, 1 = two-parent household.

<sup>l</sup> 1-5 represent actual counts, but 6+ are grouped.

3.32 (SD = 2.43), indicating that on average, respondents attended religious services more frequently than “several times a year.” Approximately 14 percent of respondents reported they never attended religious services in the last year but almost 40 percent attended at least once a month. Furthermore, Republican (40.2%) and Democrat (40.4%) political affiliations were represented evenly among the sample.

Regarding birth order, 37.5 percent of the respondents identified as *middleborn* children, whereas 25.9 percent reported they were *firstborn*, 31.4 percent reported they were *lastborn*, and 4.0 percent reported they were *only children*. About one in five respondents had six or more siblings (22.9%), with a sample mean of 3.44 (SD = 1.81). For childhood living arrangements, more than three-quarters of participants (77.1%) reported living in two-parent households (which could include biological or step-parents) at the time they were 14. More than half of respondents (63.9%) reported having engaged in sex before the age of 18 and almost nine out of ten had engaged in sex by their 21<sup>st</sup> birthday (90.1%). The mean *age at first sex* for the sample was 16.9 years (SD = 2.53). The mean *number of partners* across the respondent’s lifetime was 9.2 (SD = 15.73).

## Statistical Analyses

### *Age at First Sex*

To examine the effects of birth order on age at first sex, a simple OLS regression model was constructed where the birth order variables *firstborn*, *middleborn*, and *lastborn* were used to predict respondents’ *age at first sex* (see Table 2).<sup>3</sup> Contrary to

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<sup>3</sup>A one-way ANOVA was conducted as a preliminary analysis to test for differences in age at first intercourse by birth order ( $n = 1059$ ). The results indicated that there was not a significant relationship between birth order and age at first

the hypothesis, *middleborn* children ( $\beta = .126, p = .108$ ) and *lastborn* children ( $\beta = .117, p = .122$ ) were not significantly more likely than *only children* to initiate sexual activity at an earlier age. But interestingly, the model showed that using an alpha level of  $p < .10$ , *firstborn* children ( $\beta = .124, p = .087$ ) initiated sexual activity later compared to *only children*. Nevertheless, this model showed that birth order explained virtually none of the variation in *age at first sex* (Adjusted  $R^2 = .000$ ).

In the second model, several other control variables were also included with birth order, including the number of siblings (*sibship*), *age*, *race and ethnicity*, whether the respondent lived in a *two-parent household* at age 14, *religiosity*, *respondent's education*, *respondent's father's education*, *political preference*, and *gender* to predict *age at first sex*. Together, these variables explained roughly 16 percent of the variance in *age at first sex* (Adjusted  $R^2 = .162$ ).

When the other variables were introduced into the second model, *firstborn* was no longer significant.<sup>4</sup> Instead, *respondent's education* level ( $\beta = .235, p < .001$ ), *age* ( $\beta = .128, p < .001$ ), *religiosity* ( $\beta = .143, p < .001$ ), and *two-parent* living situation at age 14 ( $\beta = .087, p < .01$ ), was positively related to *age at first sex*. Thus, as the respondent's *level of education*, *age*, and church attendance (*religiosity*) increased, so did the reported *age at first sex*. Further, the existence of *two-parents* in the home when the respondent was 14 also increased the respondent's *age at first sex*. In regard to ethno-racial

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sex, [F (3, 1055) = .982,  $p = .40$ ]. The results showed similar age at first sex for *only children* ( $\bar{x} = 16.30$ ), *firstborns* ( $\bar{x} = 17.01$ ), *middleborns* ( $\bar{x} = 16.95$ ), and *lastborns* ( $\bar{x} = 16.93$ ). But because analysis of variance tests assume homogeneity of variance for within-group variance (Cohen 2001), analysis of groups of very dissimilar sizes may lead to unreliable results. Thus, it seemed more appropriate to use OLS regression techniques to assess the effects of birth order on age at first sex.

<sup>4</sup>When I ran the model with *only children* ( $\beta = -.034, p = .318$ ), *firstborns* ( $\beta = .018, p = .636$ ), and *lastborns* ( $\beta = -.012, p = .750$ ), but excluded *middleborns*, the results were similar with insignificant results for all three categories.



influences, compared to the Other Race group, *Blacks* ( $\beta = -.286, p < .001$ ), *Whites* ( $\beta = -.246, p < .001$ ), and *Hispanics* ( $\beta = -.166, p < .01$ ) had significantly younger *age at first sex*.<sup>5</sup> In addition, men had slightly higher ages at first sex ( $\beta = .056, p < .10$ ).

**Table 2: Multiple Regression Predicting Age at First Sex (N=1059)**

Variable	Model 1			Model 2		
	B	SE	$\beta$	B	SE	$\beta$
Constant	16.291	.387		13.094***	.921	
Firstborn	.713	.416	.124†	.544	.470	.095
Middleborn	.655	.408	.126	.439	.435	.084
Lastborn	.637	.411	.117	.374	.458	.069
Sibship				.016	.054	.012
Religiosity				.149	.034	.143***
Age				.093	.024	.128***
Gender				.283	.162	.056†
Black				-1.963	.460	-.286***
Hispanic				-1.312	.477	-.166**
White				-1.341	.419	-2.46**
Two-parent household				.524	.200	.087**
Respondent's education				.585	.093	.235***
Father's education				-.002	.045	-.002
Democrat				-.335	.226	-.065
Republican				-.033	.228	-.006
Adjusted R <sup>2</sup>	.000			.162		
F	.991			11.931***		

Notes: †  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (two-tailed test). The categories "Only child" and "Other Race" are excluded from the models as comparison groups.

<sup>5</sup> When I ran the model with Black, Hispanic and the Other Race variables, but excluded Whites, the Black ( $\beta = -.090, p = .012$ ) group had a significant and negative relationship and the Other Race group had a significant and positive relationship ( $\beta = .102, p = .002$ ). Conversely, the Hispanic group was no longer significant ( $\beta = -.004, p = .911$ ).

### *Total Number of Partners*

To examine the effects of birth order on total number of sexual partners, a third regression model was constructed where the birth order variables *firstborn*, *middleborn*, and *lastborn* were used to predict respondents' *number of partners*. As shown in Table 3, contrary to the second hypothesis, laterborns actually had fewer partners than only children: this was true for both *middleborn children* ( $\beta = -.283, p < .001$ ) and *lastborn children* ( $\beta = -.214, p < .01$ ).<sup>6</sup> Also surprisingly, *firstborn children* ( $\beta = -.198, p < .01$ ) reported significantly fewer partners than *only children*. But together these variables explained a very small proportion of the variance in *age at first sex* (Adjusted  $R^2 = .011$ ).

In a fourth model, number of siblings (*sibship*), *age* of respondent at time of the interview, *race and ethnicity* of the respondent, *two-parent household* at the time respondent was age 14, *religiosity*, *respondent's education* level, respondent's *father's education*, *political preference*, and *gender* were introduced in a regression model predicting *total number of partners*. The three birth order variables, *firstborn* ( $\beta = -.139, p < .10$ ), *middleborn* ( $\beta = -.221, p < .05$ ), and *lastborn* ( $\beta = -.154, p < .10$ ), remained significant, all having fewer partners compared to *only children*. However, *firstborn* and *lastborn* were only significant at the  $p < .10$  level.<sup>7</sup> As shown in Table 3, several of the

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<sup>6</sup> A one-way ANOVA was conducted as a preliminary analysis to test for differences in total number of partners by birth order ( $n = 1066$ ). Results from the Welch test indicated that the four birth order groups differed significantly in their reported total number of sexual partners,  $[F(3, 1179.04) = 2.99, p < .05]$ . *Only children* ( $\bar{x} = 16.88$ ), *firstborns* ( $\bar{x} = 9.78$ ), *middleborns* ( $\bar{x} = 7.68$ ), and *lastborns* ( $\bar{x} = 9.64$ ) reported dissimilar numbers of partners. Because analysis of variance tests assume homogeneity of variance for within-group variance (Cohen 2001), analysis of groups of very dissimilar sizes may lead to unreliable results. Thus, it seemed more appropriate to use OLS regression techniques to assess the effects of birth order on age at first sex.

<sup>7</sup> When I ran the model with *firstborn*, *lastborn*, and *only children*, but excluded *middleborns*, the results showed that compared to *middleborns*, *only children* ( $\beta = .115, p < .000$ ) had significantly more partners, even when including the control variables ( $\beta = .090, p < .05$ ).

control variables were also significant. Respondent's *age* ( $\beta = .101, p < .01$ ) and *level of education* ( $\beta = .091, p < .05$ ) were both statistically significant and positive, indicating that as the respondent's age and level of education increased, so did their reported number of partners. On the other hand, *gender* ( $\beta = -.221, p < .001$ ), *religiosity* ( $\beta = -.131, p < .001$ ), and *two parents* in the household at age 14 ( $\beta = -.104, p < .05$ ), were found to have a statistically significant and negative relationship with number of

**Table 3: Multiple Regression Predicting Total Number of Sexual Partners (N=1066)**

Variable	Model 3			Model 4		
	B	SE	$\beta$	B	SE	$\beta$
Constant	16.847***	2.388		3.605	5.904	
Firstborn	-7.074	2.564	-.198**	-4.966	3.017	-.139†
Middleborn	-9.174	2.511	-.283***	-7.158	2.792	-.221*
Lastborn	-7.214	2.534	-.214**	-5.187	2.934	-.154†
Sibship				.104	.349	.012
Religiosity				-.851	.219	-.131***
Age				.455	.156	.101**
Gender				-6.989	1.041	-.221***
Black				8.735	2.948	.205**
Hispanic				3.667	3.059	.075
White				4.107	2.687	.121
Two-parent household				-3.886	1.284	-.104**
Respondent's education				1.414	.597	.091*
Father's education				.025	.292	.003
Democrat				1.566	1.452	.049
Republican				.599	1.462	.019
Adjusted R <sup>2</sup>	.011			.108		
F	4.915**			7.833***		

Notes: †  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (two-tailed test). The categories "Only" and "Other Race" are excluded from the models as the comparison groups.

partners, suggesting that men, those who attend religious services more frequently, and those in two-parent households at age 14 had fewer partners. Additionally, one racial category, *Black* ( $\beta = .205, p < .05$ ), was significant and positive, indicating that Black respondents reported higher numbers of partners compared to respondents of other races. Together, these variables explained roughly 11 percent of the variance in number of partners (Adjusted  $R^2 = .108$ ).

### Summary

Overall, the results from the OLS regression analyses suggest that when including the control variables, birth order was not a statistically significant predictor of *age at first sex*, whereas eight of the other control variables were significantly related to *age at first sex*. Nevertheless, birth order was a significant predictor of *total number of partners*, but contrary to the hypotheses laterborns and even firstborns had fewer sexual partners than only children. But, once the control variables were included, the birth order variables became somewhat less significant and six of the control variables were significantly related to *total number of partners*. In conclusion, I find that when taken collectively, birth order may have an influence on certain—but not all—sexual behaviors for individuals ages 18 to 30, and that only children and firstborns may be more different than alike in their sexual behaviors. Chapter Five includes a more detailed discussion of the implications of these results. Limitations of the current study and suggestions for future research are also presented in Chapter Five as well.

## CHAPTER V

### DISCUSSION

As was expressly stated by Smith (2006), sex is a part of human nature and is not only of essential biologic importance, but of great social importance as well. Indeed, while sex may have positive social and psychological effects, some sexual behaviors can also facilitate negative psychological well-being and contribute to a variety of social problems. Many of these negative outcomes are speculated to be the product of RSB, which may include early sexual debut (before age 15) and a higher number of sexual partners. Given the deleterious possibilities, it is essential to identify and fully recognize the factors that may influence or predispose one to RSB in order to determine target groups for prevention and intervention strategies.

This study was conducted to address such a need. Using data from a large, nationally representative sample drawn from the National Health and Social Life Survey (1992), I investigated the hypothesized influence that birth order—as measured by ordinal position—would have on sexual behavior for individuals ages 18 to 30 in regard to two measures of sexual behavior: *age at first sex* and *total number of partners*. Prior research in the field of birth order has shown mixed results regarding the influence of birth order on sexual behavior, with some studies indicating a significant effect, others suggesting diminished effects mitigated by family variables, and others discounting the

role of birth order altogether. Irregularities seen across studies may be due to a lack of generalizability due to small sample sizes or non-random sampling methods, which have ultimately hindered the ability to fully access the influence of birth order on sexual behavior. In addition, some studies fail to include analyses of only children or include them with firstborns due to theoretical similarities. This study enhances the birth order literature by evaluating the influence of ordinal position on the sexual behavior of participants surveyed in a nationally representative sample of young adults. The specific research question that guided this study was: What are the effects of birth order on the age at which individuals begin to engage in sexual activity and their total number of sexual partners?

In this final chapter, I discuss the results outlined in Chapter 4 and the implications of these findings. I also present limitations of this study and offer suggestions for future research.

### Discussion of Results and Implications

Based on previous research, I framed the hypotheses using birth order theory and known predictors of sexual behavior. The hypotheses stated that birth order would similarly influence *age at first sex* and *total number of partners*; specifically, I hypothesized that laterborn individuals, both middleborns and lastborns, would engage in sex at an earlier age and have more lifetime partners than would firstborns or only children, who would share similar sexual behaviors due to similar family positions. According to birth order theory, on average, middleborns express a lower feeling of

belonging and closeness with their family and thus seek out relationships outside the familial setting. Similarly, lastborns may be less supervised and more heavily influenced by the behavior of older siblings. In addition, according to birth order theory, only children and firstborns are often treated similarly due to family positions that afford more attention and responsibility.

However, interestingly, results from this study show that birth order is not a significant predictor of age at first sex, nor was number of siblings, something birth order researchers had previously suggested. Instead, other factors such as age, level of education, attendance at religious services, and ethno-racial factors are more important predictors of age at sexual initiation. Yet, the existence of two parents in the household when the respondent was a teenager (age 14) was positively related to age at first sex, suggesting that while the number of siblings and order of birth may not be related to age at first sex, other family structure variables may play important roles in determining age at first sex.

On the other hand, results from this study show that birth order may be an important predictor of number of sexual partners. Birth order theory posits that due to lax parental supervision and an increased exposure to potential sexual partners through their older siblings, middleborn and lastborn children may have more opportunity to engage in sexual behaviors. Further, birth order theorists suggested that middleborns and lastborns (to a lesser degree) would seek attention outside of the family when they felt their emotional needs were not being met. These feelings are amplified in larger families as parental resources—including emotional attention—must be shared by each sibling. Yet,

contrary to the hypothesis, results from this study indicate that middleborns and lastborns reported fewer partners than did only children and firstborns. In fact, only children had an average number of partners that was almost double that of other ordinal positions. Further, middleborns had the fewest number of partners. So, while previous research had suggested that middleborns report a desire to seek attention outside the family, results from the current study show that these sentiments do not directly translate to sexual behavior.

There are a number of factors that may explain this: First, the difference in number of partners may partially be the result of the respondent's age; when *age* was introduced into the model, *middleborn* and *lastborn* became less significant and age was positively related to number of partners. Second, the increased number of partners for only children and firstborns may be partially related to level of education. There was a significant, positive relationship between level of education and number of partners, suggesting that college attendance increased number of partners. This is interesting since birth order theory has shown that firstborns and only children attend college and achieve graduate degrees more often than do middleborns and lastborns. Two reasons are often cited for this overrepresentation of higher education levels for firstborns and only children. One reason is that firstborns and only children typically indicate an increased sense of responsibility and desire for success and accomplishment. Another reason is due to financial restraints placed on the family as number of children grows (thus affecting middleborns and lastborns more so than firstborns or only children). Whatever the reason, it would follow that there may be a connection between the influence that birth order has



on college attendance, which is then coupled with the influence of college attendance on number of partners.

The last important finding of this study indicates that while previous theoreticians have suggested that only children and firstborns act in similar ways due to strict parental supervision and a heightened feelings of responsibility reported by these two ordinal positions, this study shows that only children and firstborns are different in some important ways. For example, compared to only children, firstborns actually had later age at sexual initiation and fewer sexual partners. One possible explanation is that since number of siblings (*sibship*) was not found to be related to number of partners, but the *absence of siblings* (only children) was, this may suggest that siblings act as a protective factor—decreasing sexual activity—by providing emotional support and human interactions that may be lacking in one-child families.

Taken together, these findings both challenge and reaffirm birth order theory. First, birth order does not significantly affect age at sexual initiation, but it does shape total number of lifetime sexual partners. However, the biggest difference in birth order related to sexual behavior is between *only children* and others, not between different ordinal positions for families with more than one child. Such findings illustrate the importance of examining contextual factors at multiple levels of analysis such as sibling interactions and parent-child relationships for understanding young adult sexual behavior.

## Study Limitations

While the findings of this study may help broaden our understanding of the relationship between birth order and sexual behavior, several limitations need to be addressed. The operationalization of birth order using *ordinal position* (*only child*, *firstborn*, *middleborn*, and *lastborn*), may have hindered my ability to fully assess the potential influence of birth order. The limited categories related to birth order may have masked differences within groups, erasing experiences of each birth rank (1<sup>st</sup> born, 2<sup>nd</sup> born, 3<sup>rd</sup> born, etc.). For example, in this study, secondborn children are included in the *middleborn* category, but, as Adler suggested, second-born children may have unique sibling relationships from other middleborn children. One other important limitation to consider is that the proportion of respondents who were only children in this analysis was relatively small compared to those with siblings.

Another limitation of the current analysis may also involve the measurement of number of siblings. Due to grouped data in the NHSLS database for number of brothers and number of sisters, calculating the combined number of siblings was not precise for respondents from larger families as sibling groups larger than six were all grouped into a single category. Therefore I was unable to precisely calculate the influence that *sibship* had in relation to sexual behavior. While it can be argued that large sibling groups may function similarly regardless of the exact number of children, it can also be argued that a more precise count of siblings is necessary.

Next, although it was the focus of this study to investigate the influence of birth order on *consensual* sexual activity, unfortunately many people also experience non-

consensual sex. For example, in this analysis, participants who reported an age at first sex younger than age 12 were excluded due to their inability to legally consent to sex before age 12. Exclusion of younger instances of sex may have possibly overshadowed a potential connection between birth order and early sexual debut, a marker of risky sexual behavior.

Finally, although this study adds to the field of birth order and sexual behavior research by offering results that can be generalized to the larger population, the data are also relatively dated, which may limit its applicability to contemporary society. The respondents analyzed in this analysis are now middle-aged and the last two decades have surely seen changes in attitudes and behaviors in newer generations of young adults.

#### Future Research

Given the limitations of the current analysis, similar analyses should be conducted as new datasets become available in order to provide a better understanding of how the results relate to younger generations. Future research may also benefit from replicating the analyses utilizing a more precise operationalization of birth order, such as *serial birth order* (1<sup>st</sup> born, 2<sup>nd</sup> born, ... 9<sup>th</sup> born, and so on), to more accurately reflect the exact impact of each birth position. Given the findings that *only children* were unique in many respects, it may be helpful to oversample *only children* in future analyses. Similarly, further analysis of the role of the number of siblings in a sibling constellation is also suggested, including the gender and spacing between siblings in order to better control for interactions between siblings during childhood.

Future research should also consider different components of risky sexual behavior. For example, the issue of consent is one topic that should be investigated more thoroughly, especially in regard to age of consent to sexual activity. Exploring consent and sex before an individual is legally permitted to engage in sex may offer valuable insight into risky sexual behavior.

In addition, given that engagement in sexual activity is quite common for young adults, birth order effects may not have been fully apparent in the current analysis. For instance, there was relatively low variance overall in age at first sex for the sample as evidenced by the fact that 90 percent of respondents had engaged in sex by age 20, and 99 percent by age 24. Further research may benefit from examining variations in attitudes about sex, using a wider definition of sex that includes other forms of sexual behavior, measures of the frequency of acts, or age of each participant. As such, researchers may be able to glean a better understanding of variations specific sexual acts such as oral or anal sex instead of just vaginal intercourse, or group sex rather than coupled sex.

Relatively low variance in initiation into sexual activity also suggests that social norms regarding sexual activity may be more influential than the order of one's birth and individual statuses, such as age, race, gender, and social status, may not offer a comprehensive explanation for within-group variance in sexual behavior. As such, community and societal level influences should also be included in future analyses, thus providing an integrated, multi-level approach to the examination of RSB. The authors of the NHLS argue that instead of merely asking if ethnicity (for example) influences engagement in sex, questions should also assess which aspects of ethnic traditions,

norms, or belief systems that may increase or decrease the propensity to engage in sex. Similarly, many analyses of RSB lack a broader understanding of the reasons behind these behaviors. If the focus of understanding the role of birth order in shaping sexual behavior is to be applied to decreasing young adults' RSBs, future research must delve deeper by investigating the underlying contexts related to those risk factors. Indeed, prevention campaigns aimed at lowering RSB are most successful when they address a wide number of noted risk factors.

### Concluding Thoughts

Past research has demonstrated a relationship between the order of one's birth relative to her/his siblings and her/his subsequent sexual attitudes and behaviors. In general, there seems to be support for birth order theory. As shown in the current study, while birth order was a significant predictor of one form of sexual behavior (total number of partners), it was not predictive of the other (age at first sex). Nevertheless, the results do provide some support for birth order theory in several ways. First, when operationalized as the four ordinal positions *only child*, *firstborn child*, *middleborn child*, and *lastborn child*, birth order is associated with certain RSB— in this case, total number of partners. Second, these results also suggest that it is important to examine *only children* as a separate category since *only children* display significantly different characteristics than firstborns. For these reasons, birth order should be included in surveys such as the Youth Risk Behavior Survey, the National Intimate Partner and Sexual Violence Survey, or more locally, the Grand Forks Youth Risk Behavior survey.

If more researchers include measures of birth order in surveys of youth and young adults, we would be better equipped to identify the individual and within-family factors that influence sexual behavior, and more specifically, RSB. An increased understanding of sexual behavior among young adults may have profound implications at both the individual level and at the societal level, as such information could be potentially used to help decrease levels of RSB and reported cases of STIs, while also increasing emotional and physical well-being of young adults for generations to come.

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