

# The Effects of Religiosity and Sibling Relationships On the Timing of Sexual Debut

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**ABSTRACT.** This study examined the effects of religiosity and sibling relationships on the timing of sexual debut. The sample was comprised of 352 students randomly selected from a university in the Southeastern United States. Sibling relationships had a small but significant effect on the timing of sexual debut. There was a higher chance of an individual not having had, or delaying, their sexual debut when their sibling relationships were characterized by low sibling warmth/closeness, high sibling relative status/power, high sibling conflict, and low sibling rivalry. Religiosity had a significant effect, with higher levels of religiosity resulting in later age of sexual debut. Furthermore, level of religiosity was more significant in emerging adulthood than in adolescence. Both sibling relationships and religiosity independently had an effect on the timing of sexual debut. Implications for research and practice are discussed.

## Introduction

When many adults think of adolescence, they think not only of a time of change but also a time of rebellion. Although most adolescents go through this period with relatively little strife, there is a high propensity for some to engage in risk-taking behavior more so than during other periods of their life (Haugaard, 2001). One such risky behavior is early sexual activity. Many adolescents in the United States are having, have had, or are about to have sex. The percentage of youth in grades 9-12 who have ever had sex was 46.7% in 2003, a small increase from 2001 when 45.6% of youth reported that they had sex. However, compared to 1991, when 54.1% of youth had had sex, there has been an overall decline in the percentage of youth having sex (YRBSS, National Youth Risk Behavior Survey, 2003). One in five adolescents has had sex by the time they are 15 years old (Albert, Brown & Flanigan, 2003).

Age of sexual debut can be framed within the risk and protective factors theory. Risk factors are "those characteristics, variables, or hazards that, if present for a given individual, makes it more likely that this individual, rather than someone selected from the general population, will

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develop a disorder" (Mrazek & Haggerty, 1994, p. 127). Protective factors are "factors that mediate or moderate the effect to risk factors, resulting in reduced incidence of the problem behavior" (Pollard & Hawkins, 1999, p. 145). In other words, these factors can be anything that safeguards an adolescent from a risk (Garnezy, 1985; Pollard & Hawkins, 1999; Rutter, 1979).

Gardner's (1993) rational choice theory describes adolescent decision making to engage in risk behaviors and includes how developmental changes affect the decision making process. Gardner proposes that an adolescent may engage in risky sexual behaviors, including early sexual debut, because to the adolescent, the potential (immediate) benefits outweigh the potential (long-term) costs. Gardner's risk-taking theory "proposes that adolescents engage in more risk-taking than adults because in adolescence the advantages of engaging in risk-taking outweigh the disadvantages, while in adulthood the disadvantages of engaging in risk-taking outweigh the advantages" (Haugaard, 2001 p. 44). According to this theory, the immediate benefits of a risky behavior outweigh the future consequences in the mind of the adolescent because the future is uncertain. It is completely rational for an adolescent/emerging adult to choose a benefit he understands to be certain, over one that is a possibility (Gardner, 1993).

Social learning theory explains how adolescents learn through imitation and modeling (Bandura, 1977). Furthermore, through vicarious reinforcement, they not only learn a new behavior, but also the consequences of that behavior. Research has primarily examined how parents and peers affect social learning, with substantially less research focused on sibling relationships, even though they are usually some of the longest lasting relationships in a person's life (Bandura, 1977).

## **Literature Review**

### **Religiosity**

Religiosity can affect development by giving comfort, hope, a sense of purpose, and guidelines for how to live. Previous research has shown the capacity for religiosity to be a protective factor against risky behaviors, such as drug use and early sexual debut (Bahr, Maughan, Marcos, & Li, 1998; Lammer, Ireland, Resnick, & Blum, 1999; and Meier, 2003). Specifically, Meier (2003) found that higher religiosity reduced the percentage of adolescents having sex. Other study found that religiosity had an indirect effect on sexual debut by influencing attitudes towards sex (Rostosky, Regnerus & Write, 2003).

Religiosity appears to change with age, which is important when considering its effect on the timing of sexual debut. King and Boyatzis (2004) stated that "in adolescence, many youth turn toward religion and greater civic involvement, and yet many others who turn away from religion join with gangs or hate groups, or become antisocial in other ways" (p. 2). One study found that mothers were significantly more religious than their children (Ellis, Lee, Wagermann, & Bruce, 1993), possibly because as an individual ages, religiosity may become increasingly important. This suggests that religiosity may be a protective factor for adolescents, especially for those who turn to religion during adolescence.

### **Sibling Relationships**

Sibling relationships are some of the longest-lasting relationships a person will have during his or her lifetime. A few studies have linked the quality of sibling relationships to depression, anxiety, and behavior problems (Deater-Deckard, Dunn & Lussier, 2002; McHale & Gamble, 1989; Stocker, 1993, & Stocker, Lanthier & Furman, 1997). Also, some studies have looked at

sibling influence as it is related to alcohol, drug use, and unprotected sex (Bahr, et. al., 1998; D'Amico & Fromme, 1997; Olenick, 1998; Rodgers & Rowe, 1988; Rodgers & Rowe, 1990).

One sibling model widely used in current research pertains to the quality of sibling relationships (Furman and Buhrmester, 1985). This model focuses on four dimensions: warmth/closeness, relative status/power, conflict, and rivalry. Warmth/closeness in sibling relationships has been found to be positively correlated with self-disclosure and intimacy (Howe, Aquan-Assee, Bukowski, Lehous, & Rindalid, 2001; Howe, Aquan-Assee, Bukowski, Rindalid, & Lehous, 2000), as well as the amount of contact between siblings in adult sibling relationships (Stocker, et. al., 1997). Lack of warmth/closeness was also associated with high conflict, depression, internalizing problems, and antisocial behavior problems (Deater-Deckard, et. al., 2002). Warmth/closeness may be a dimension of sibling relationships that acts as a protective factor in delaying sexual debut. Warmth/closeness was examined in this study.

Relative status/power is the dimension that changes the most with age. It is normally a very significant factor for sibling relationships during childhood and gradually decreases, as siblings grow older (Buhrmester & Furman, 1990) and can cease to exist in adult relationships altogether (Stocker, et. al., 1997). Since this dimension seems to decrease with age, it may not have much effect on the timing of sexual debut.

Some sibling conflict is normal and may even benefit development. High levels of conflict, however, are detrimental; and even mild levels can cause aggression, maladjustment, depressed mood, anxiety, and delinquent behavior (Saroglou & Fiasse, 2002; Stocker, Burwell & Briggs, 2002). High conflict, when paired with a lack of warmth/closeness, has been associated with depression, internalizing problems, and antisocial behavior problems (Deater-Deckard, et. al., 2002). Higher levels of conflict might lead to other risky behaviors, such as a decreased age of sexual debut.

The last dimension in sibling relationships is rivalry. Research shows that sibling relationships become less intense with age. The degree at which that happens and the relative importance of the sibling relationship is different with every individual. The amount of contact in adult sibling relationships is negatively associated with rivalry (Stocker, et. al., 1997). Rivalry may affect risk behaviors as siblings compete for parental attention.

Religiosity and siblings are key variables that can potentially influence timing of sexual debut. Religiosity may give a person a more predictable view of their future and teach them self-control, therefore decreasing the probability that a risk behavior will be rational. Furthermore, with social learning through a religious institution, adolescents might balance self-regulation against participation in deviant behaviors. Involvement with siblings also may give a similar sense of a predictable future; however, sibling relationships are not as well researched. Research on sibling relationships includes Bandura's (1977) social learning theory to examine how younger siblings model older siblings' behavior and Furman and Burhmaster's (1990) quality of sibling relationship variables.

There are many protective factors that can influence an adolescent's decision to become sexually active, including but not limited to: opportunity, peer pressure, parenting style, sibling relationships, religiosity, and their own personal desire (Etzkin, Barnett, Smith, Schwartz & Baugh, 2010; Lammer et al., 1999; Linder, Hetherington, & Reiss, 1999; Meier, 2003; Olenick, 1998). This study closely examined how religiosity and sibling relationships affect the onset of sexual debut.

## Methods

### Sample and Procedures

The sample for this study was selected from students enrolled at a large university in the Southeastern United States in 2005. The sample was comprised primarily of undergraduate students although graduate and professional students were also included in the study.

There were 55 religious organizations at the university contacted to recruit study participants, including Christian, Jewish, and Muslim groups; and encompassing graduate, undergraduate and combined organizations. Three fourths ( $n=42$ ) of the organizations were randomly selected for participation in the study. The president of each organization was contacted by email and asked to respond to a request to allow the researcher to ask members of the organization to participate in this study. A second email contact was sent to organizations that did not respond. After both emails, two phone calls were made to the president of those organizations that had not responded to either email or the first phone call. Of the 42 organizations that were contacted, only seven organizations chose to participate. In addition to the religious organizations, five large undergraduate classes were included in the sample, in order to expand the sample to include participants who were not religious, and to increase the sample size.

All potential participants were informed that their participation was voluntary, confidential, and anonymous, in accordance with the university's institutional review board (IRB) regulations. At each data collection point, potential respondents were told not to participate if they did not have any siblings at the time of the survey or when growing up. To avoid duplication of responses, they were also instructed not to respond if they had already completed the questionnaire at another meeting or class.

The mean and median age of the participants was 21 years old ( $SD=3$ ). Ages of participants ranged from 18 years old to 44 years old. There were a total of 193 female participants (61.5%) and 121 male participants (38.5%), which is similar to the slightly larger gender imbalance overall at the university, where female population is 53.6% ( $n=25,649$ ) of the total population and the male population is 47.4% ( $n=23,116$ ) of the total University population.

Participants' highest level of education completed was ascertained. The overwhelming majority (82.4%) had at least some college education ( $n=258$ ), because the sample was drawn directly from a student population. Just over 12% of the sample had a bachelor degree or higher and everyone had at least a high school degree.

### Research Design and Instrumentation

This study used a cross-sectional research design where data collection occurs at one point in time and examines multiple cases (Bryaman, 2001; de Vaus, 2001). Cross-sectional studies look for relationships between two or more variables, although they cannot conclusively explain the direction of a relationship. In other words, a limitation of cross-sectional design is that it is "not possible to draw causal inferences" (Bryaman, 2001, pg. 41). For this study, the predictor variables (sibling relationships and religiosity) and the outcome variable (age of sexual debut) were examined to determine whether there was any relationship between them.

The Sibling Relationships, Religiosity, and Sexual Debut Questionnaire (SRRSDQ) was created for use in this study to examine the research questions. The questionnaire included the following sections: demographics, family constellation variables, Sibling Relationship Questionnaire (SRQ), age of sexual debut, participant religiosity, and participant's perception of sibling religiosity. The SRRSDQ took approximately 15 to 20 minutes to complete.

The demographics section contained items measuring gender, educational level and age of participants. This section asked participants to list their siblings (including themselves) in order by listing their current age, relationship to participant and whether or not they lived at home while the participant was growing up. They were also asked to list the total number of siblings, their birth order, their sibling's birth order and the age difference between them and their sibling. In addition, they were asked to identify the name of the sibling that they felt the closest to, if they had more than one sibling. They were instructed to use this sibling as a basis of reference for answering all of the questions about "their sibling".

The Sibling Relationship Questionnaire (SRQ) consists of 16 one-dimensional scales, each containing three questions (Buhrmester & Furman, 1990). The scales are all in a five point Likert-like format and "the internal consistency coefficients (Cronbach's alpha) from these composites all exceeded 0.70 except for the competition scale (0.63)" (Furman & Buhrmester, 1985, p. 452). For this study, all of the scales had a Cronbach's Alpha greater than 0.70 except for Maternal Partiality (0.66) and Antagonism (0.57). Furthermore, from 15 scales "four factors were extracted, accounting for 71% of the common variance" (Furman & Buhrmester, 1985, p. 452). These four factors are explained in the literature review and are warmth/closeness, relative status/power, conflict, and rivalry.

The next section included items regarding the participant's sexual debut and their sibling's sexual debut. The first set of questions was in reference to whether or not the participant was a virgin at the time of the study. Participants who responded "Yes" were asked to skip down to a section based on their current age. Participants who responded "No" were asked to answer whether or not their debut was voluntary. Participants who responded "Yes" were asked to identify their age of sexual debut. The data of the participants who responded "No" to this question were not analyzed because their debut was not a choice.

Next, there were two questions to determine how often participants did and do discuss sex. The sixth question in this section was asked in regards to the participant and his or her sibling and their beliefs and actions in regard to sex and marriage. This was followed by a question regarding their level of certainty regarding their sibling's age of sexual debut. The last question in this section asked how they found out about their sibling's sexual debut and age of sexual debut.

The next section asked questions about the participant's religious beliefs, their religion, and their denomination/sect. Three of the questions were designed to obtain attitudes/beliefs about religiosity and were set in a 5 point Likert format. The next three questions were to determine action and were select-only-one responses format with the answer options ranging from daily to never. Participants were asked to answer the questions for both adolescence and emerging adulthood. The internal consistency (Cronbach's Alpha) for the adolescence religiosity index was 0.88 and for the emerging adulthood religiosity index was 0.89.

In order to examine whether the participants' religiosity correlated with their perception of their sibling's religiosity, this question was asked, "Does sibling religiosity affect participant's religiosity?" This index is the same index used to obtain participant levels of religiosity, except that participants were asked to answer the questions, to the best of their knowledge, in regard to their sibling's beliefs, at both adolescence and emerging adulthood. The internal consistency (Cronbach's Alpha) for the participant's perception of sibling's adolescence religiosity index was 0.92 and for the participant's perceptions of sibling's emerging adulthood religiosity index it was 0.91.

## Data Analyses

First, a factor analysis on the Participant Religiosity Index, the Sibling Relationship Questionnaire (SRQ), and the Sibling Religiosity Index was conducted. The objectives of this analysis were the creation of an Index of Religiosity and to determine what, if any, latent variables were created from the 16 scales within the Sibling Relationship Questionnaire. Next, a multi-factor survival analysis was conducted, using the Index of Religiosity and the latent variables determined during the factor analysis of the SRQ, to answer the first two research questions (Q1: Do sibling relationships affect the timing of sexual debut? Q2: Does the level of religiosity affect timing of sexual debut?). This test analyzed the percentage chance that individuals will have their sexual debut by a certain age, in regard to the dependant variables. For the third research question (Q3: Does participant religiosity correlate with perception of sibling religiosity?) the statistical test used was a non-parametric Spearman Correlation.

## Results

A total of 325 participants completed the Sibling Relationships, Religiosity, and Sexual Debut Questionnaire (SRRSDQ). Eleven cases were incomplete or cases where the respondent had involuntarily lost their virginity and was therefore excluded from the study. The following analysis is based on responses of the remaining 314 participants.

### Religiosity

Of the participants in this study, an overwhelming majority classified themselves as *Christian*, both during adolescence (83.7%) and emerging adulthood (83.0%). *Other* was the second largest category (9.2% in adolescence; 9.8% in emerging adulthood). Religions that typically fall under Christianity made the largest *Other* category for adolescence (n=14) and the second largest for emerging adults (n=11). It included Catholic, Methodist, Eastern Orthodox, Episcopalian, Lutheran, Seventh Day Adventist, and Presbyterian. The second largest category within *Other* for adolescents was no religion (n=10) and it was the largest for emerging adults (n=13) whose response was a question mark, in limbo, or blank.

Participants' perception of sibling's religion was very similar to their reports of their own religion. Of the 314 participants included in the analysis, 309 responded to the religion question; however, only 290 answered this question for their siblings. Again, an overwhelming majority classified themselves as *Christian*, both during adolescence (84.1%) and emerging adulthood (82.3%). *Other* was again the second largest category (7.9% in adolescence; 9.1% in emerging adulthood). The largest category within *Other* was no religion for both adolescents (n=10) and for emerging adults (n=9) which included none, blank, question mark, and not sure. Religions that typically fall under Christianity, made the second largest *Other* category for both adolescence (n=9) and for emerging adults (n=8), and include Catholic, Methodist, and Seven Day Adventist.

### Sexual Debut

Of the 193 women in the study, 70 (36.3% of females) had not had their sexual debut and 123 (63.7% of females) reported having experienced their sexual debut. Similarly, of the 121 men, 44 had not experienced their sexual debut (36.4% of males) and 77 (63.6% of males) had had their sexual debut. The percentage of participants who had had their sexual debut was almost identical for each gender, with 64% of both genders having had their sexual debut and 36% not having had their sexual debut.

A majority of participants responded that they had experienced their sexual debut (63.7%;  $n=200$ ). The number of respondents who had not experienced their sexual debut (who were still virgins) was 114 (36.3%). Four participants who did not answer this question were excluded from the data analyses. Of the 200 participants who reported that they experienced their sexual debut, 8 did not respond to age of sexual debut question and were excluded from the analysis.

The following analyses examined the 192 participants who reported experiencing their sexual debut and who gave their age of sexual debut. The youngest age of sexual debut for any participant in this study was 11 years old, and the oldest age of sexual debut was 24 years old. The mean age and the median age of sexual debut were 17 years old.

The SRRSDQ asked if participants planned to wait until they were married to have their sexual debut, along with whether they have actually had or not had their sexual debut. These questions were measured by having respondents pick one of the following statements: (a) I planned to wait until marriage to have my sexual debut and I did; (b) I plan to wait until marriage to have my sexual debut and I have not had my sexual debut; (c) I planned to wait until marriage to have my sexual debut but I have had my sexual debut; (d) I do not plan to wait for marriage to have my sexual debut and I have not had my sexual debut; (e) I did not plan to wait for marriage to have my sexual debut and I have had my sexual debut. The largest percentage of respondents (41.3%;  $n=128$ ) chose answer (e), agreeing that, "I did not plan to wait for marriage to have my sexual debut and I have had my sexual debut." The second largest group representing 29.4% ( $n=91$ ) of the sample, chose (b), "I plan to wait until marriage to have my sexual debut and I have not had my sexual debut;" and the third largest group, with 24.2% ( $n=75$ ) selected (c), "I planned to wait until marriage to have my sexual debut but I have had my sexual debut". If those who at least intended to wait were added together, over half (53.6%) of the sample said that they planned to wait until they were married to have their sexual debut. Only 4.5% ( $n=14$ ) participants responded that "d) I do not plan to wait for marriage to have my sexual debut and I have not had my sexual debut", but less than one percent (0.6%), only 2 participants, said that "I planned to wait until marriage to have my sexual debut and I did".

### **Sibling Relationships**

This study used Furman and Buhrmester's Sibling Relationship Questionnaire (SRQ) to examine sibling relationships. The SRQ consists of 16 scales: Prosocial Behavior; Maternal Partiality; Nurturance of Sibling; Nurturance by Sibling; Dominance of Sibling; Dominance by Sibling; Paternal Partiality; Affection; Companionship; Antagonism; Similarity; Intimacy; Competition; Admiration of Sibling; Admiration by Sibling; and Quarreling. Each of the scales consists of 3 questions. In Furman and Buhrmester's study (1985) all of the scales had a Cronbach's alpha of 0.70 except for competition scale (0.63). For this study, all of the scales had a Cronbach's Alpha greater than 0.70 except for Maternal Partiality (0.66) and Antagonism (0.57).

Furman and Buhrmester conducted a factor analysis (with a promax rotation) on the 16 scales and had four factors, or dimensions, that had an Eigen value greater than 1.0. These "four factors were extracted, accounting for 71% of the common variance" (Furman & Buhrmester, 1985, p. 452). They then labeled the four factors as the four dimensions of sibling relationships: warmth/closeness, relative status/power, conflict, and rivalry. These dimensions of sibling relationships are well known and are used in other studies since Furman and Buhrmester's pilot study in 1985.

For this study, a factor analysis was also conducted on the data collected using the 16 scales within the SRQ. Similar to Furman and Buhrmester's findings, there were four factors that had

an Eigen value greater than 1.0. Another factor analysis, with a promax rotation with a kappa 4, was conducted and those factor scores were saved as new variables, one for each of the four dimensions.

Next, each participant's factor score for the sibling relationship dimension was recoded in a high or low category. This process enabled similar factor scores for individual participants to be grouped together for the survival analyses. Participants that fell below the mean factor score were put into the low category for that particular dimension and participants that had a mean factor score or higher were put into the high category for that particular dimension. Therefore, since the mean factor score was 1.0 for each dimension, a factor score from  $-\infty$  through  $-0.00001$  was coded as low (1) for each respective dimension and a factor score of  $0.000000$  through  $\infty$  was coded as high (2) for each respective dimension.

A Kaplan-Meier survival analysis was used to examine each dimension's relationship to timing of sexual debut. One of the benefits of using a Kaplan-Meier Survival Analysis is that it allowed all of the cases to be examined, not just the ones in which an event had occurred, by including censored data. Censored data is "information from cases in which the final event of interest had not yet occurred" (Pugh & Jones, 2004, p. 908). In this case, if a person has not yet had their sexual debut, their current age is used and the event is censored. For the survival analysis, each age (age of sexual debut or current age) was cross-run against the status of whether or not they have had their sexual debut.

In the following sections on sibling warmth/closeness and sibling relative status/power, 296 participants were included in the analysis. In the sibling conflict section, 295 participants were analyzed; for the sibling rivalry section, 154 participants were analyzed.

### Sibling Warmth/Closeness

Of the 296 participants included, 144 (48.65%) had low warmth/closeness and 152 (51.35%) had high warmth/closeness in this analysis, as shown in Table 1. There were more virgins in the low sibling warmth/closeness level ( $n=55$ ; 38.19%) than the high level ( $n=54$ ; 35.53%). Conversely, there were more non-virgins with high warmth/closeness ( $n=98$ ) than with low warmth/closeness ( $n=89$ ). The mean and median ages of sexual debut were the same for both levels of sibling warmth/closeness, 21 years old and 19 years old respectively.

Table 1.

*Sexual Debut Status as a Function of Sibling Warmth/Closeness for a Sample of University Students in the Southeast U.S.*

	Sibling Warmth/Closeness Level	
	Low	High
Youngest Non-Virgin	13	11
Youngest Virgin	18	18
Oldest Non-Virgin	31	24
Oldest Virgin	25	29

The *youngest non-virgin* with *low* warmth/closeness was 13 years old and the *oldest* was 31 years old. The *youngest virgin* with *low* warmth/closeness was 18 years old and the *oldest* was 25 years old. The *youngest non-virgin* with *high* warmth/closeness was 11 years old and the *oldest* was 24 years old. The *youngest virgin* with *high* warmth/closeness was 18 years old and the *oldest* was 29 years old.

The survival analysis looked at the overall percentage chance of remaining a virgin to a certain age, when one variable was changed. As stated earlier, both the participants who have had their sexual debut and those who had not were included in the survival analysis. For those who had not had their sexual debut, their current age was used and their case was censored. Basically, they had remained (survived as) a virgin so far.

From ages 11-17, there was not a significant difference between participants that had a high level of sibling warmth/closeness versus a low level of sibling warmth/closeness in regard to age of sexual debut. From age 18 to age 27, there was a slightly higher percentage of those with a lower level of sibling warmth/closeness who did not have their sexual debut than those with a high level of sibling warmth/closeness.

### **Sibling Relative Status/Power**

Of the participants included, 145 participants (48.99%) were represented in the low category and 151 (51.01%) in the high category. With low relative status/power, 50 were virgins and 95 were not virgins at the time of this study. For high relative status/power, there were more virgins ( $n=59$ ) and fewer non-virgins ( $n=92$ ) than for low relative status/power. For participants with high relative status/power, the mean age was higher (22 years old) than for low sibling relative status/power (20 years old). The median age (19 years old), however, was the same for both levels of sibling relative status/power.

The *youngest non-virgin* with *high* relative status/power was 13 years old and the *oldest* was 31 years old. The *youngest virgin* with *high* relative status/power was 18 years old and the *oldest* was 29 years old. The *youngest non-virgin* with *low* relative status/power was 11 years old and the *oldest* was 24 years old. The *youngest virgin* with *low* relative status/power was 18 years old and the *oldest* was 27 years old.

Between ages 19 and 27, a slightly higher percentage of those with a higher level of sibling relative status/power reported having had their sexual debut compared to those with a low level of sibling relative status/power. There was not a significant difference between participants that had a high level of sibling relative status/power versus a low level of sibling relative status/power in regard to age of sexual debut for ages 11 through 18.

### **Sibling Conflict**

Of the 295 participants, 156 (52.88%) had low conflict and 139 (47.12%) had high conflict. There were more virgins with high conflict than with low conflict and more non-virgins with low conflict than with high conflict. For participants with high sibling conflict, the mean age of sexual debut was 21 years old and for low conflict the mean age of sexual debut was 20 years old. The median age of sexual debut for high sibling conflict was 19 years old and for low sibling conflict was 18 years old. Both the mean and median age decreased as level of sibling conflict decreased.

The *youngest non-virgin* with *high* conflict was 13 years old and the *oldest* was 31 years old. The *youngest virgin* with *high* conflict was 18 years old and the *oldest* was 29 years old. The *youngest non-virgin* with *low* conflict was 11 years old and the *oldest* was 23 years old. Moreover, the *youngest virgin* with *low* conflict was 18 years old and the *oldest* was 27 years old.

There was not a significant difference between participants that had a high level of sibling conflict versus a low level of sibling conflict in regard to age of sexual debut from age 11 to 17. From age 18 to 23 there was a slightly higher percentage of those with a higher level of sibling

conflict who had their sexual debut than those with a low level of sibling conflict. Conversely, from age 24 to 27 there was a slightly higher percentage of those with a lower level of sibling conflict who had not had their sexual debut than those with a high level of sibling conflict.

### **Sibling Rivalry**

There were 154 participants (52.03%) who had low sibling rivalry and 142 (47.97%) who had high sibling rivalry (n=296). The mean age and median age for sexual debut was lower for those with high sibling rivalry than for those with low sibling rivalry. The median age for those with high sibling rivalry was 20 years old; for low sibling rivalry it was 21 years old. The median age for those with high sibling rivalry was 18 years old, for those with low sibling rivalry it was 19 years old. There were more virgins (censored cases) and fewer non-virgins (events) with low rivalry than with high rivalry.

The age difference of *non-virgins* with *high* rivalry was between 13 and 31 years of age. *Virgin* age range with *high* rivalry was between 18 and 25 years old. The range of *non-virgin* with *low* rivalry was 11 to 24 years old. The range of age for *virgins* with *low* rivalry was 18 to 29 years old.

From ages 16 to 29, there was a difference in level of rivalry in regard to timing of sexual debut. Those with a high level of rivalry had a lower percentage chance of remaining a virgin to the same age as compared to those who had a low level of rivalry. For ages 11 to 15, there was no significant difference in level of sibling rivalry in regard to timing of sexual debut.

Sibling relationships had a small effect on the timing of sexual debut from around ages 17 to 27. There was higher chance of not having a sexual debut when there was low warmth/closeness, high relative status/power, high conflict, and low rivalry. There was not a significant effect of sibling relationships on timing of sexual debut from ages 11 to 16.

### **Religiosity**

Since level of religiosity was measured for adolescence and emerging adulthood, each participant was instructed to answer the following questions as they were during adolescence and as they were or are during emerging adulthood: How important is/was religion to you?; How important is/was God to you?; How important is/was spirituality to you?; How often do/did you attend; church/synagogue/formal place of worship?; How often do/did you pray?; How often do/did you attend a religious/spiritual based group, other than a church/synagogue/formal place of worship (examples: youth group, college group, or bible study)? The internal consistency (Cronbach's Alpha) for the adolescence religiosity index was 0.88 and for the emerging adulthood religiosity index was 0.89.

A principal components factor analysis was performed on the six questions for the periods of adolescence and emerging adulthood. For both the adolescent and emerging adulthood index analyses, there was one factor that has an Eigen value greater than 1.0. The mean for both of the factor scores was 0.0 with a standard deviation of 1.0. For adolescent religiosity, the one factor explained 66.1% of the variance; and for emerging adulthood religiosity, the one factor explained 65.4% of the variance.

Each factor score was then saved as a new variable and transformed for each participant into high, medium, or low religiosity. If a participant had a factor score from  $-\infty$  to -1.00001, then they had a high religiosity score. For a factor score from -1.00000 to 1.00000, a medium

religiosity score was given. The medium religiosity range was one standard deviation, both negative and positive, from the mean; for a normal distribution, 62% of the population would fall in this range. Lastly, 1.00001 to  $\infty$  fell in the low religiosity category

Next, a Kaplan-Meier Survival Analysis was performed. Censored cases were the cases in which the event, in this case sexual debut, had not occurred. Each participant's age was cross-run against the status of their sexual debut (had or had not had their sexual debut). For those that had not had their sexual debut, their current age was run and the event was censored) and that is examined with the adolescent factor score code (whether a person had a high, medium, and low religiosity).

### **Adolescent Religiosity**

A total of 307 participants were included in this analysis and most, 64.82% (199) were in the medium religiosity group, while 16.61% (51) were in the high religiosity group and 18.57% (57) were in the low religiosity group. The mean age of sexual debut and median age of sexual debut decreased as level of participant religiosity decreased. For participants with high adolescent religiosity, the mean age was 23 years old and the median age was 23 years old. For medium adolescent religiosity, the mean age was 21 years old and the median age was 19 years old. For low adolescent religiosity, the mean age was 19 years old and the median age was 17 years old.

The *youngest non-virgin* with *high* adolescent religiosity was 13 years old and the *oldest* was 23 years old. The *youngest virgin* with *high* adolescent religiosity was 18 years old and the *oldest* was 29 years old. The *youngest non-virgin* with *medium* adolescent religiosity was 13 years old and the *oldest* was 31 years old. The *youngest virgin* with *medium* adolescent religiosity was 18 years old and the *oldest* was 27 years old. The *youngest non-virgin* with *low* adolescent religiosity was 11 years old and the *oldest* was 22 years old. The *youngest virgin* with *low* adolescent religiosity was 19 years old and the *oldest* was 28 years old.

There was a clear distinction starting at 15 and ending at age 27, between those with high, medium, and low religiosity and their chance of not having sex until a certain age. For example, based on this data the chance is almost 30% that a person will be a virgin (not had their sexual debut) by age 20 if they have low adolescent religiosity; if they have a medium level of adolescent religiosity the percentage increases to 40%; and if they have a high adolescent religiosity level the percentage chance that they will be a virgin until age 20 is 60%.

### **Emerging Adulthood Religiosity**

There were a total of 311 participants included in this analysis (as shown below in Table 2). Of the 311 participants; 51 (16.40%) were in the high religiosity group, 211 (67.85%) were in the medium religiosity group, and 49 (15.75%) were in the low religiosity group. The mean age of sexual debut decreased as the level of emerging adulthood participant religiosity decreased. For participants with high emerging adulthood religiosity, the mean age was 25 years old and the median age was 23 years old. For medium emerging adulthood religiosity, the mean age was 21 and for low adolescent religiosity the mean age was 17 years old. The median age of sexual debut was 19 years old for medium level emerging adulthood religiosity and 17 years old for a low level of emerging adulthood religiosity.

Table 2.

*Age of Sexual Debut Survival Analysis as a Function of Adolescent Religiosity for a Sample of University Students in the Southeast U.S.*

Analysis	Adolescent Religiosity Level		
	High	Medium	Low
Youngest Non-Virgin	13	13	11
Youngest Virgin	18	18	19
Oldest Non-Virgin	23	31	24
Oldest Virgin	27	29	20

The *youngest non-virgin* with *high* emerging adulthood religiosity was 13 years old and the *oldest* was 23 years old. The *youngest virgin* with *high* emerging adulthood religiosity was 18 years old and the *oldest* was 27 years old. The *youngest non-virgin* with *medium* emerging adulthood religiosity was 13 years old and the *oldest* was 31 years old. The *youngest virgin* with *medium* emerging adulthood religiosity was 18 years old and the *oldest* was 29 years old. The *youngest non-virgin* with *low* emerging adulthood religiosity was 11 years old and the *oldest* was 24 years old. The *youngest virgin* with *low* emerging adulthood religiosity was 19 years old and the *oldest* was 20 years old.

There was a clear distinction starting at 14 and ending at age 24, between those with a high, medium, and low religiosity and their percentage chance of surviving (not having sex) until a certain age. For example, based on these data the chance a person will be a virgin (not had their sexual debut) by age 20 if they have low adolescent religiosity is just over 10%; if they have a medium level of adolescent religiosity the percentage increases to almost 50%; and if they have a high adolescent religiosity level the percentage chance that they will be a virgin until age 20 is approximately 80%.

### Participant Religiosity and Their Sibling's Religiosity

All of the possible correlation relationships were significant at the 0.01 level (as shown in Table 3). Participants' adolescent religiosity and participants' perception of siblings' adolescent religiosity was the most significant relationship with a correlation coefficient of 0.658. The next highest correlation ( $\rho=0.581$ ) was between participant adolescence religiosity and participants' perception of sibling's emerging adulthood religiosity. Participant emerging adulthood religiosity and participants' perception of sibling's emerging adulthood religiosity had a correlation coefficient of 0.493. The least significant correlation ( $\rho=0.343$ ), although still significant at the 0.01 level, was between participant emerging adulthood religiosity and participants' perception of sibling's adolescence religiosity.

## Discussion

### Theory

Social learning theory (Bandura, 1977) states that individuals learn through observing others, not just through their own trial and error. Furthermore, through vicarious reinforcement, people are able to learn the benefits and consequences associated with certain behaviors. This learning phenomenon is especially interesting when studying the effects of religion and sibling relationships on the timing of sexual debut. For example, most religions give clear guidelines and/or rules about sex before marriage. Younger siblings may observe negative or positive consequences as a result of their sibling's choice to have or not have sex. Adolescents can learn

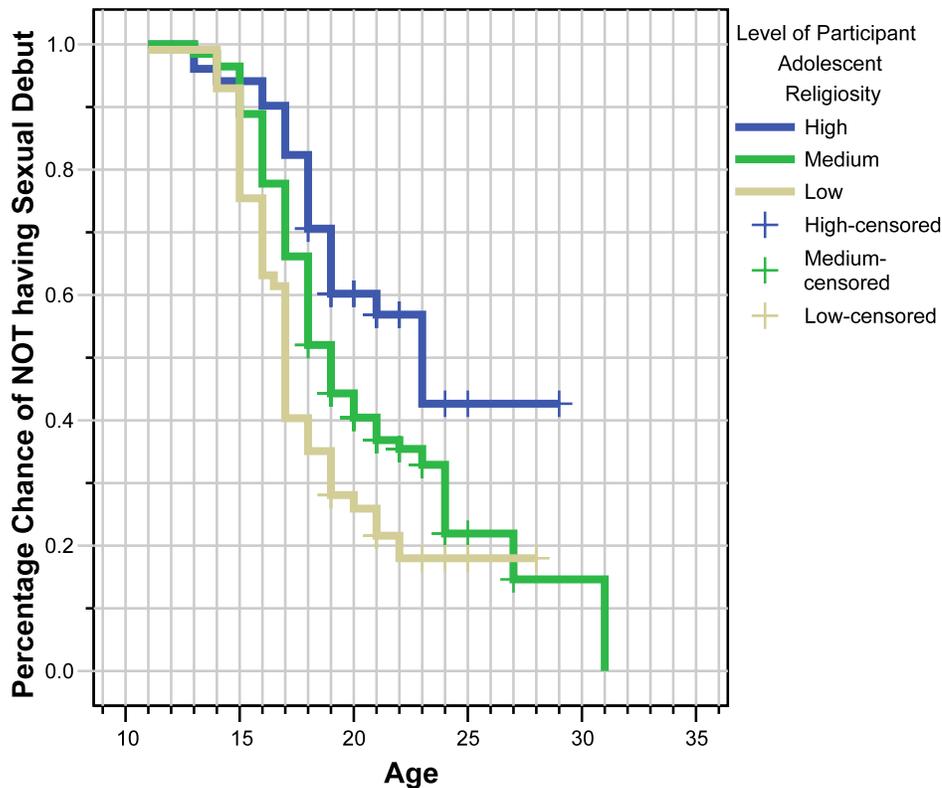
social norms by not only hearing or reading about them, but by observing the actions of those around them.

Furthermore, through modeling, older siblings may set a negative or positive example for their younger siblings to follow. In addition, a person might learn by observing the behaviors of those who have similar religious beliefs. Table 3 shows that the correlation between participants' religiosity and perceptions of their siblings' religiosity is significant in adolescence and emerging adulthood. Further evidence of the possible effects of modeling is seen in Figure 1 and Figure 2. Those with high religiosity have a higher percentage chance of delaying their sexual debut than those with lower levels of religiosity.

Table 3.  
*Age of Sexual Debut Survival Analysis as a Function of Adolescent Religiosity for a Sample of University Students in the Southeast U.S.*

<b>Correlations</b>					
<b>Spearman's rho</b>		Participants' Adolescent Religiosity	Participants' Emerging Adulthood Religiosity	Participants' Perception of Siblings Adolescent Religiosity	Participants' Perception of Siblings Emerging Adulthood Religiosity
Participants' Adolescent Religiosity	Correlation Coefficient Sig. (2-tailed) N	1.000 . 307	.435(**) .000 304	.658(**) .000 256	.581(**) .000 210
Participants' Emerging Adulthood Religiosity	Correlation Coefficient Sig. (2-tailed) N	.435(**) .000 306	1.000 . 311	.343(**) .000 256	.493(**) .000 214
Participants' Perception of Siblings Adolescent Religiosity	Correlation Coefficient Sig. (2-tailed) N	.658(**) .000 256	.343(**) .000 256	1.000 . 258	.804(**) .000 212
Participants' Perception of Siblings Emerging Adulthood Religiosity	Correlation Coefficient Sig. (2-tailed) N	.581(**) .000 210	.483(**) .000 214	.804(**) .000 212	1.000 . 215
**. Correlation is significant at the 0.01 level (2-tailed).					

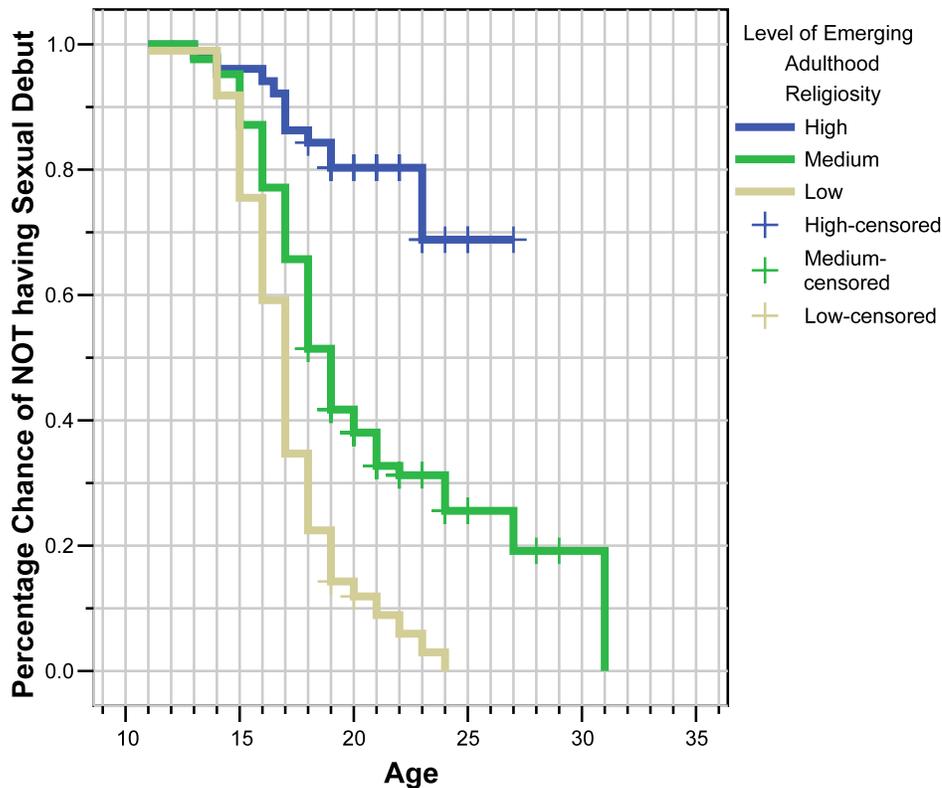
Figure 1. *Age of Sexual Debut Survival Analysis as a Function of Adolescent Religiosity for a Sample of University Students in the Southeast U.S.*



A popular conceptual approach for examining sibling relationships is the Furman and Buhrmester Sibling Relationship Model (1985). The child sibling relationship questionnaire (SRQ) and the adult sibling relationship questionnaire (ASRQ) measure dimensions of sibling relationships through a variety of scales. Other research using these scales found four dimensions of sibling relationships: warmth/closeness, relative status/power, conflict and rivalry. However, in adult relationships, relative status/power was uncommon or rare. Because of its established use with adolescents and the anticipated age of potential participants in this study, the SRQ initially seemed more appropriate; however, at completion, neither the SRQ nor the ASRQ seem to be ideal. What is needed is another instrument covering adolescence through emerging adulthood. If the instrument was able to better capture the quality of sibling relationships, the outcomes in relation to sexual debut in the survival analyses might have been different.

Although Bandura's Social Learning theory (1977) and Furman and Buhrmester's Quality of Sibling Relationships Model (1985) were the underlying theories for this study, the results indicate that they may not be well suited to explain the effects of religiosity and sibling relationship on the timing of sexual debut. This study contributes to the body of literature on religiosity by providing results that indicate both religiosity and sibling relationships may be protective factors for delaying sexual debut.

Figure 2. *Age of Sexual Debut Survival Analysis as a Function of Emerging Adulthood Religiosity for a Sample of University Students in the Southeast U.S.*



### Limitations of Study

The social sensitivity of associated with sexual debut and religion may be a limitation to this study. Participants might not give correct information in regard to the timing of their sexual debut, fearing that their answer might not be socially acceptable. Another limitation in this study is that some of the questions are retrospective. Participants were asked to answer questions about their sexual debut, their sibling relationships as it was while they were growing up and about religiosity during adolescence and emerging adulthood. Having retrospective questions can lead to memory recall error. Generalizability is another limitation. The study was conducted on students from a large Southeast University. The results should only be generalized to similar populations.

### Implications for Research and Practice

This study found that sibling relationships were important in regard to timing of sexual debut and should not be overlooked or ignored. Further research is needed, however, to clarify how sibling relationships affect the timing of sexual debut and how sibling relationship type could act as a protective or risk factor. Additionally, this study clearly indicated that religion is a very important factor in the timing of sexual debut. These findings also confirm the results of other research regarding the links between religious participation and sexual activity (Ellis, Lee, Wagermann, & Bruce, 1993). These results suggest that one way practitioners and parents might

delay teens' sexual debut would be to encourage youth to take an active and personal role in their faith. In addition, this study found that religiosity has an impact into young adulthood. Perhaps religiosity has a greater effect on the timing of sexual debut during emerging adulthood because people are pursuing matters out of choice, rather than because their parents "make them" or want them to participate in religious activities. Since emerging adulthood religiosity had a greater effect on the timing of sexual debut than adolescent religiosity, it might indicate that when religion becomes more personal, i.e. a person no longer has to participate because their parents make them or want them to participate, it has a greater impact.

## References

- Albert, B., Brown, S., & Flanigan, C. (Eds.) (2003). *14 and younger: The sexual behavior of young adolescents (Summary)*. Washington, DC: National Campaign to Prevent Teen Pregnancy.
- Ali, L., Scelfo, J., Downey, S., & Juarez, V. (2002). Choosing virginity. *Newsweek*, 140(24), 60-66.
- Arnett, J. J. (2001). *Adolescence and emerging adulthood: A cultural approach*. Upper Saddle River, New Jersey: Prentice Hall Incorporated
- Bahr, S. J., Maughan, S. L., Marcos, A. C., & Li, B. (1998). Family, religiosity, and the risk of adolescent drug use. *Journal of Marriage and the Family*, 60(4), 979-992.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliff, NJ: Prentice Hall.
- Bandura, A. (1997). *Self-efficacy*. New York: W. H. Freeman.
- Bryman, A. (2001). *Social research methods*. New York: Oxford University Press Incorporated.
- Buhrmester, D., & Furman, W. (1990). Perceptions of sibling relationships during middle childhood and adolescence. *Child Development*, 61, 1387-1398.
- D'Amico, E. J., & Fromme, K. (1997). Health risk behaviors of adolescent and young adult siblings. *Health Psychology*, 16(5), 426-432.
- de Vaus, D.A. (2001). *Research design in social research*. Thousand Oaks, CA: SAGE Publications Incorporated.
- Deater-Deckard, K., Dunn, J., & Lussier, G. (2002). Sibling relationship and social emotional adjustment in different family contexts. *Social Development*, 11(4), 571-590.
- Deater-Deckard, K., & Plomin, R. (1999). An adoption study of the etiology of teacher and parent reports of externalizing behavior problems in middle childhood. *Child Development*, 70(1).
- Ellis, Lee, Wagermann, & Bruce, M., (1993). The religiosity of mothers and their offspring as related to the offspring's sex and sexual orientation. *Adolescence*, 28(109), 222-222.
- Etzkin, R., Barnett, R.V., Smith, S., Schwartz, S.E., Baugh, E.J. *Parenting style and the timing of Jewish adolescents' sexual debut*. Journal of Youth Development (in press).
- Etzkin, R., Barnett, R.V., Smith, S., Schwartz, S.E., & Baugh, E.J. *The Influence of Religiosity on the Timing of Jewish Adolescents' Sexual Debut*. (In review: Journal of Youth Development.)
- Furman, W., & Buhrmeseter, D. (1985). Children's perceptions of the qualities of sibling relationship. *Child Development*, 55, 448-461.
- Gardner, W. (1993). A life-span rational choice theory of risk taking. In N. Bell & R. Bell (Eds.), *Adolescent risk taking* (pp. 66-83). Newbury Park, CA: Sage.
- Garnezy, N. (1985). Stress-resistant children: The search for protective factors. In J. E. Stevenson (Ed.), *Recent research in development psychopathology* (pp. 213-233). New York: Pergamon Press.
- Hall, G. S. (1904). *Adolescence: Its psychology and its relation to physiology, anthropology, sociology, sex, crime, religion, and education* (Vols. 1 & 2). Englewood Cliffs, NJ: Prentice-Hall.
- Haugaard, J. J. (2001). *Problematic behaviors during adolescence*. New York, NY: McGraw-Hill.
- Howe, N., Aquan-Assee, J., Bukowski, W. M., Lehou, P. M., & Rindalid, C. M. (2001). Siblings as confidants: Emotional understanding, relationship warmth, and sibling self-disclosure. *Social Development*, 10(4), 439-454.

- Howe, N., Aquan-Assee, J., Bukowski, W. M., Rindalid, C. M., & Lehous, P. M. (2000). Siblings' self-disclosure in early adolescence. *Merrill-Palmer Quarterly*, 46(4), 653-671.
- King, P. E. & Boyatzis, C. J. (2004). Exploring adolescent spiritual and religious development: Current and future theoretical and empirical perspectives. *Applied Developmental Science*, 8(1), 2-6.
- Lammer, C., Ireland, M., Resnick, N., & Blum, R. (1999). Influences on adolescents' decision to postpone onset of sexual intercourse: A survival analysis of virginity among youths age 13 to 18 years [Electronic Version]. *Journal of Adolescent Health*, 26(1), 42-48.
- McHale, S. M., Gamble, W. C., (1989). Sibling relationships of children with disabled and nondisabled brothers and sisters. *Developmental Psychology*, 25(3), 421-429.
- Meier, A. M. (2003). Adolescents' transition to first intercourse, religiosity, and attitudes about sex. *Social Forces*, 81(3), 1031-1052.
- Mrazek, P. J., & Haggerty, R. J. (Eds.). (1994). Reducing risks for mental disorders: Frontiers for preventive intervention research. Washington, DC: National Academy Press.
- Olenick, I. (1998). Adolescent with sexually active older siblings are likely to have sex early. *Family Planning Perspectives*, 30(3), 149-150.
- Pollard, J. A. & Hawkins, J. D. (1999). Risk and Protection: Are both necessary to understand diverse behavioral outcomes in adolescence? *Social Work Research*, 23(3), 145-159.
- Pugh, R. & Jones, P. (2004) Survival analysis in social work research. *British Journal of Social Work*, 34(6), 907-914.
- Rodgers, J. L., & Rowe, D. C. (1988). Influence of siblings on adolescent sexual behavior. *Development Psychology*, 24(5), 722-728.
- Rodgers, J. E., Rowe, D. C. (1990). Adolescent sexual activity and mildly deviant behavior. *Journal of Family Issues*, 11(3), 274-293.
- Rostosky, S. S., Regnerus, M. D., & Write, M. L. C. (2003). Coital debut: The role of religiosity and sex attitudes in the add health survey. *The Journal of Sex Research*, 40(4), 358-367.
- Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M.W. Kent & J. E. Rolf (Eds.), *Primary prevention of psychopathology: Social competence in children* (Vol. 3.) Hanover, NH: University Press of New England.
- Saroglou, V., Fiasse, L. (2002). Birth order, personality, and religion: A study among young adults from a three-sibling family. *Personality and Individual Differences*, 35, 19-29.
- Stocker, C. M. (1993). Siblings' adjustment in middle childhood: Links with mother-child relationships. *Journal of Applied Developmental Psychology*, 14(4), 485-499.
- Stocker, C. M., Burwell, R. A., Briggs, M. L. (2002). Sibling conflict in middle childhood predicts children's adjustment in early adolescence. *Journal of Family Psychology*, 16(1).
- Stocker, C. M., Lanthier, R. P., Furman, W. (1997). Sibling relationships in early adulthood. *Journal of Family Psychology*, 11(2), 210-221.
- YRBSS (Youth Risk Behavior Surveillance System) & CDC (Center for Disease Control and Prevention). (2003). *Trend in the prevalence of Sexual Behaviors*.