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Parents, Peers, and Sexual Values Influence Sexual Behavior During the Transition to College

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Abstract

Several decades of research have identified the contributions of psychosocial influences on adolescent and young adult sexual behavior; however, few studies have examined parental and peer influence and sexual values during the transition from high school to college. The current study tested the influence of sexual values and perceived awareness and caring (PAC), or beliefs about how much parents and peers know and care about students' behavior, on sexual behavior during this transitional period. Using data from a longitudinal study, generalized estimating equations and the generalized linear model were used to examine the associations among sexual values, parental and peer PAC, and sexual behavior, both cross-sectionally and longitudinally. Participants (N = 1,847; 61% female) completed web-based surveys the summer before college matriculation and at the end of the first semester in college. Results indicated that individuals with high levels of both parental and peer PAC engaged in less frequent sexual behaviors and that PAC moderated the effect of sexual values on sexual behaviors. Furthermore, both PAC variables decreased during the transition from high school to college, and high school sexual values, parental PAC, and their interaction predicted the number of sexual partners during the first semester of college. Only sexual values and high school unsafe sexual behaviors predicted unsafe sexual behavior in college. Findings suggest that complex associations exist among perceived awareness and caring, sexual values, and sexual behaviors, and that the transition from high school to college may be an ideal time for safer-sex interventions.

Keywords

Parents; Peers; Sexual behavior; College students

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Introduction

By high school graduation, 47% of U.S. students report lifetime sexual activity, and34% report sexual activity within the past three months (Centers for Disease Control and Prevention, 2006). Following college matriculation, rates of lifetime sexual activity increase to 75% (American College Health Association, 2006) and are accompanied by increased numbers of sexual partners and the increased practice of serial monogamy (Corbin & Fromme, 2002). The increased numbers of sexual partners have been associated with both unplanned pregnancy (Williams & Bonner, 2006) and sexually transmitted infections (STIs; Snyder, 2006). Thus, college matriculation represents a unique opportunity to examine changes in sexual behavior during the transition from adolescence to emerging adulthood, especially the relative influences of parents and peers.

Parental Influences on Sexual Activity

Longitudinal studies suggest that parents influence the behavior of their offspring through both support (Ream & Savin-Williams, 2005) and monitoring (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003). Parental support relates to the quality of the parent–child relationship and includes involvement and encouragement in their child's life and activities (Kotchick, Shaffer, & Forehand, 2001). Decreased parental support has been associated with decreased parent–child interactions, greater involvement in deviant peer groups, and increased likelihood of sexual activity (Goldstein, Davis-Kean,&Eccles, 2005; Ream & Savin-Williams, 2005). Parental monitoring is the awareness and supervision of their offspring's behavior. Well-monitored adolescents report less sexual activity, fewer sexual partners, and increased condom use compared to poorly-monitored adolescents (Huebner & Howell, 2003; Rai et al., 2003). In sum, the offspring of parents who are supportive or watchful of their adolescent's behavior have a lower likelihood of sexual activity and risky sexual practices. The potential additive influence of both monitoring (knowing) and support (caring) has not previously been examined with regard to sexual behaviors.

Peer Influences on Sexual Activity

Intervention studies and programs indicate that peer influence on adolescent behavior operates both through peer support (Tevyaw, Borsari, Colby, & Monti, 2007) and peer monitoring (Gilmore, 2005). Peer support is an empathic and validating relationship between peers that includes helping with decision making, empowerment, and developing awareness (Campbell, 2004). For example, brief motivational interventions with a supportive peer resulted in a threefold reduction in alcohol use and problems compared to brief motivational interventions alone (Tevyaw et al., 2007). Similar to parental monitoring and positive peer pressure, peer monitoring occurs when individuals observe and respond to their peers' behaviors. Several institutions (e.g., corporations, universities) have incorporated peer monitoring into their employee and student policies in an attempt to decrease risky behaviors (e.g., alcohol consumption, illicit drug use, Gilmore, 2005; Horowitz, 2004). The possible influence of peer support and monitoring, however, has not been explored in relation to sexual behavior.

Perceived Awareness and Caring

During the transition from high school to college, emerging adults (Arnett, 2000, 2004) often rely on the attitudes and behaviors of parents and peers to help guide them through this unstable time. Emerging adults are also influenced by how others view them (Engeln-Maddox, 2005; Novak & Crawford, 2001). Prior to the current survey development and onset of the longitudinal study, Patel, Harden, and Fromme (2003) conducted focus groups of freshmen and sophomore students to examine students' expectations and motivations about college. A common and consistent belief was voiced during these groups about how the perceived awareness and caring by parents and peers influenced the students' decision-making and behavior. The concept that students described clearly reflected more than simply monitoring (i.e., knowledge) about the individual's behavior or support (i.e., quality of their relationships). Rather, it was the students' beliefs that important others in their lives (e.g., parents and peers) both knew and cared about what the students were doing that guided their behavior. Students further compared their sense of being known during high school (e.g., "everyone knew whether you were having sex") to the relative anonymity of college (e.g., "no one knows if you're hooking up"). Conceptualized as the integration of awareness and caring, the level of perceived awareness and caring (PAC) by parents and peers has been associated with alcohol consumption during the transition from high school to college (Wetherill& Fromme, 2007) and may be associated with sexual behavior during this time period as well.

Based on the extant literature and recent findings, we propose that perceived awareness and caring is the synthesis of monitoring (awareness) and support (caring). Individuals who perceive that others are aware of and genuinely care about his or her behavior or well-being may alter their behaviors based on these perceptions. For example, when people perceive a high level of awareness and caring from others, they may feel under scrutiny, which could lead to more cautious or conservative behavior out of concern about how others may view them. Conversely, the perception of little or no awareness and caring from others may lead the individual to feel relatively unknown and anonymous, providing a context in which riskier behaviors are more likely to occur (Lowenstein, 1997; Millar, 2007).

Sexual Values

Research remains unclear about the potential influence of sexual values and attitudes during the transition from high school to college. Some evidence suggests that college students are more accepting of casual sex and feel less guilt about sex than do their younger counterparts (Chara & Kuennen, 1994; Herlitz & Ramstedt, 2005). In terms of sexual intimacy, both male and female emerging adults continue to endorse a double standard that allows men more sexual freedom than women (Crawford & Popp, 2003). Furthermore, individuals with more conservative sexual values endorse fewer sexual behaviors (Patrick & Lee, 2008; Taris, 2000) and individuals with more liberal values endorse more frequent and risky sexual behaviors (Knox, Sturdivant, & Zusman, 2001). Support for the effect of parental and peer influence on sexual values, however, is mixed; some have found that parental attitudes toward premarital sex were more influential for men and peer attitudes more influential for women (Treboux & Busch-Rossnagel, 1990), but others have found that college women rate parents as having more influence on their sexual attitudes than friends (Sanders & Mullis,

1988). It may be that perceived awareness and caring from parents and peers alter the effect of sexual values on sexual behavior.

Perceived Awareness and Caring, Sexual Values, and Sexual Behaviors

The current study investigated the influence of students' perceived awareness and caring from parents and peers on sexual behavior, and whether these perceptions moderated the association between sexual values and sexual behavior during the potentially unstable transition from high school to college. Four hypotheses were tested: (1) Cross-sectionally, higher levels of parental PAC and peer PAC would be associated with fewer sexual behaviors during both high school and college. Furthermore, PAC would moderate the association between sexual values and sexual behavior during both high school and college, such that higher levels of PAC in conjunction with conservative sexual values would be associated with fewer sexual behaviors, and lower levels of PAC in conjunction with liberal sexual values would be associated with more sexual behaviors. (2) From high school to college, both parental PAC and peer PAC would decrease while sexual behaviors would increase. (3) Longitudinally, those with more liberal sexual values in high school would show greater decreases in PAC during college as they select into environments with lower perceived awareness and caring by peers and less oversight by parents. (4) Across the transition from high school to college, longitudinal analyses will reveal that both parental and peer PAC moderate the association between sexual values and sexual behavior, such that higher levels of PAC in conjunction with more conservative sexual values would be associated with fewer increases in sexual behaviors from high school to college, but lower levels of PAC in conjunction with more liberal sexual values would be associated with greater increases in sexual behaviors during the transition to college.

Method

Participants

Participants (N = 2,245; 60% female) were unmarried, first-year college students between the ages of 17 and 19 years. The majority of the participants were Caucasian (59%), with 20% Asian American, 19% Hispanic/Latino(a), 7% mixed ethnicity, and 1% unspecified. These percentages were similar to the overall incoming class, where 57% were Caucasian, 18% were Asian American, 17% were Hispanic/Latino(a), and 5% were African-American (University of Texas at Austin, 2004). In high school, 22% of participants were dating non-exclusively and 41% were dating exclusively; in college, 23% were dating non-exclusively and 35% were dating exclusively.

The data come from a longitudinal study examining alcohol and behavioral risks during the transition from high school to college. Participants were initially recruited from a sample of 6,391 first-time, incoming college freshmen attending a large southwestern university's orientation program or by mail during the summer prior to starting freshmen year. A total of 4,832 (75.6%) students agreed to participate, provided contact information and were later randomly assigned to one of three assessment conditions: (1) surveys about the last three months of high school and Year 4 of college; (2) a survey during only Year 4 of college; (3)

and semiannual surveys beginning during the summer before college matriculation. The current data are based on the latter semiannual assessment sample.[1]

A total of 2,245 participants (73.7% of the randomized sample) completed the high school survey, and 2,077 (92%) were retained for the fall survey. Of these participants, 1,928 (93%) provided sufficient data at both time points to be included in the current analyses. Comparisons between the 1,928 participants who provided complete data and the 319 who did not yielded several significant differences. Women were more likely than men to provide complete data (88.9% vs. 81.3%), $\chi^2(1) = 25.49$, $p < .001$, as were Caucasians relative to non-Caucasians (87.6% vs. 83.2%), $\chi^2(1) = 8.28$, $p < .005$. Furthermore, those individuals with complete data reported higher levels of parental and peer PAC but lower levels of sexual values (see Table 1). There were, however, no significant differences between those who provided complete data and those who did not on the number of three month sexual partners, frequency of unprotected sex with a monogamous partner, or frequency of unprotected sex with a non-monogamous partner.

Procedure

Participants were invited to access Internet-based surveys through a secure website (DatStat, Seattle, WA), where they provided informed consent and completed the initial survey about their last three months of high school. Three weeks prior to the end of the fall semester, participants were invited by letter and email to complete a similar online survey about the last 3 months of their first fall semester in college. Participants received $30 and $20 for completion of the high school and fall surveys, respectively.

Measures

Demographic measures included gender, age, ethnicity, and parental income.

Sexual Behavior—Indices of sexual behavior over the past three months captured three distinct categories of sexual risk: (1) number of sexual partners (for oral, vaginal, and/or anal sex) scored on a continuous metric; (2) number of occasions of unsafe sex with a monogamous partner (i.e., sex without protection against STIs and pregnancy with an exclusive dating partner); and (3) number of occasions of unsafe sex with a non-monogamous partner (i.e., sex without protection against STIs and pregnancy with a non-exclusive partner). These latter two items were coded 0 = 0 to 6 = >20.

Perceived Awareness and Caring (PAC)—The PAC measures used in the current study were developed by the investigators and are included in Appendix 1. The six-item Parent-PAC assessed the perceived parental knowledge and caring about the individual's behavior (see Appendix 1). Participants estimated how often during the past three months there was an adult (e.g., parent, guardian) who knew and cared about their behavior (e.g., whether they drank, used drugs, had sex, etc.). Five point response options ranged from 1 =

[1]Not included in the current analyses were participants who would complete a high school and Year 4 assessment and participants who would complete only the Year 4 assessment.

not at all to 5 = always. The average across all six items was used as a summary index and Cronbach's α was 0.92.

The seven-item Peer-PAC questionnaire (see Appendix 1) assessed perceived peer knowledge and caring about the individual's behavior. Similar to parental PAC, participants estimated how often during the past three months the people in their peer group knew and cared about the participant's behavior (e.g., sexual activity, alcohol and illicit drug use, etc.). Five-point response options ranged from 1 = not at all to 5 = always. The average across all seven items was used as a summary index and Cronbach's α was 0.95. The means and SDs for each PAC item at each time point are shown in Table 2.

Sexual Values—Sexual values were assessed only during high school and included five items that were adapted from Perkins and Berkowitz (1986) (see Appendix 2). The items measure the degree of permissiveness participants hold about sexual behaviors; for example, "It is important for me to wait until marriage to have sex" (reverse scored) and "it is okay for me to have casual sex without being in a relationship." Five-point response options ranged from 1 = disagree to 5 = agree. The average across the five items was used as a summary index, with greater scores representing liberal views toward sex and lower scores representing conservative views toward sex. Cronbach's α was 0.74.

Statistical Analyses

Analyses were conducted using generalized linear models (GLM; McCullagh & Nelder, 1989), generalized estimating equations (GEE; Hardin & Hilbe, 2003), and ordinary least squares (OLS) regression. For Hypotheses 1 and 2, GEE was implemented because it is an alternative approach to modeling multilevel data when response variables are distributed non-normally; GEE provides population-averaged estimates of regression coefficients across multiple waves of data. Analyses were conducted separately for each of the three dependent variables (number of sexual partners, occasions of unsafe sex with a monogamous partner, and occasions of unsafe sex with a non-monogamous partner). For both GLM and GEE analyses, standard effect size estimates such as R-squared or standardized β are unavailable for these analyses because they are not based on normal-theory statistics (Hardin &Hilbe, 2003), and are, therefore, not reported. For Hypothesis 3, OLS regression was implemented because there was only one time point (i.e., Freshman year of college) used as the dependent variable. For Hypothesis 4, GLM was implemented to deal with the heavily skewed non-normal data.

Results

The Effects of Sexual Values and PAC on Sexual Behavior in High School and College

The first hypothesis was that, within each time point, higher levels of parental PAC and peer PAC would be associated with fewer sexual behaviors, and that PAC would moderate the association between sexual values and sexual behaviors.[2] A GEE model with a negative

[2]Preliminary analyses indicated that the inclusion of sociodemographic variables, including ethnicity and parental income, did not significantly alter the observed associations between parental PAC, peer PAC, and the three sexual behavior variables. Therefore, these variables were not included in the reported analyses.

binomial reference distribution and log link function was implemented; high school and college data were simultaneously analyzed, but only concurrent associations (i.e., high school independent variables associated with high school dependent variables and college independent variables associated with college dependent variables) were modeled. Analyses were conducted in three steps: (1) main effects for gender, parental PAC, peer PAC, and sexual values; (2) two-way interactions of parental PAC × sexual values, peer PAC × sexual values, and parental PAC × peer PAC; (3) three-way interaction of parental PAC × peer PAC × sexual values.

The final GEE models for number of sexual partners, unsafe sex with a monogamous partner, and unsafe sex with a non-monogamous partner are shown in Table 3 and Fig. 1. For number of sexual partners, Step 1 was significant, $\chi^2(4) = 533.2$, $p < .001$, with gender, sexual values, and parental PAC making significant contributions. Step 2 was also significant, $\chi^2(3) = 37.59$, $p < .001$, with parental PAC × sexual values and peer PAC × sexual values significant. Finally, Step 3was also significant, with liberal sexual values being associated with more sexual partners. For individuals low in peer PAC (i.e., 5th percentile), there was no significant association between parental PAC and number of partners, but for individuals with liberal sexual values and high peer PAC (i.e., 95th percentile), higher levels of parental PAC were associated with a greater number of sexual partners.

For unsafe sex with a monogamous partner, Step 1 was significant, $\chi^2(4) = 144.97$, $p < .001$, with gender and sexual values being significant. Step 2 was also significant, $\chi^2(3) = 11.95$, $p = .008$, but of the two-way interactions, only parental PAC × sexual values was significant. Finally, Step 3 (the three-way interaction) was also significant. For unsafe sex with a non-monogamous partner, Step 1 was significant, $\chi^2(4) = 194.78$, $p < .001$, with gender and sexual values making significant contributions. Step 2 was also significant, $\chi^2(3) = 14.98$, $p = .002$, but again of the two-way interactions, only parental PAC × sexual values was significant. Finally, Step 3 was not significant ($z = 1.18$).

Analysis of Change from High School to College

The second hypothesis was that peer and parental PAC would decrease, and sexual behaviors would increase, across the transition from high school to college. Analyses were conducted via GEE and models were parameterized to allow determination of main effects for gender and time, as well as the gender × time interaction. The reference distribution was specified as a negative binomial for the sexual variables and as normal for parental and peer PAC. Descriptive and inferential statistics are shown in Table 4.

For parental PAC, the omnibus model test was significant, $\chi^2(3) = 1074.5$, $p < .0001$, as were both main effects and the interaction. Women reported higher levels of parental PAC than men in high school ($d = .22$, $z = 4.59$) and college ($d = .44$, $z = 9.55$). Both women ($d = .60$, $z = 20.82$) and men ($d = .85$, $z = 23.05$) reported decreases in parental PAC, although the decrease was greater for men than for women ($d = .25$, $z = 5.35$). For peer PAC, the omnibus model test was significant, $\chi^2(3) = 321.1$, $p < .0001$, as were the gender and time main effects. Women reported higher levels of peer PAC than men ($d = .45$), and both genders experienced equivalent decreases in peer PAC over time ($d = .30$). For number of sexual partners, the omnibus model test was significant, $\chi^2(3) = 42.9$, $p < .001$. Findings revealed

that gender differences were negligible in high school but following college matriculation women increased their number of partners ($d = .17$, $z = 6.41$, $p < .0001$) whereas men did not ($d = .02$, $z = 0.45$, ns). For both unsafe sex with an exclusive partner, $\chi^2(3) = 5.8$, and unsafe sex with a non-exclusive partner, $\chi^2(3) = 4.5$, the omnibus models were not significant, indicating no significant gender or time effects.

Effects of High School PAC and Sexual Values on College PAC

The third hypothesis was that across the transition from high school to college, individuals with more liberal sexual values in high school would experience greater decreases in PAC as they entered college. Analyses were conducted separately for parental and peer PAC, with college PAC as the dependent variable in each analysis. Models were based on OLS regression and were built in three steps: (1) main effects for gender, high school PAC, sexual values; (2) two-way interactions of high school PAC × sexual values, gender × high school PAC, and gender × sexual values; and (3) the three way interaction of high school PAC × sexual values × gender (see Table 5). At each step, *F* and *t* tests were used to assess significance.

For parental PAC, Step 1 was significant, $F(3, 1924) = 176.64$, $p < .001$, $R^2 = .22$, with significant effects of gender, high school parental PAC, and sexual values. Neither Step 2, $F(3, 1921) = 1.84$, nor Step 3, $F(1, 920) = 0.39$, were significant. For peer PAC, Step 1 was significant, $F(3, 1924) = 155.35$, $p < .001$, $R^2 = .20$, with gender, high school peer PAC, and sexual values making significant contributions. Neither Step 2, $F(3, 1921) = 1.55$, nor Step 3, $t(1, 920) = 1.54$, were significant. Thus, more liberal sexual values in high school were associated with greater decreases in both parental PAC and peer PAC across the transition from high school to college, and this effect was constant across gender and all levels of PAC.

Longitudinal Analysis of Sexual Values and PAC on Sexual Behavior

The fourth hypothesis was that sexual values would moderate the longitudinal associations among high school parental and peer PAC on college sexual behavior. Analyses were conducted similarly to those for Hypothesis 1, with the exception that high school PAC variables were used to predict college sexual behaviors. Thus, this analysis represents a longitudinal extension of the cross-sectional associations in Hypothesis 1. Analyses were conducted using GLM with negative binomial reference distribution and log link function. Additionally, the high school values of the college dependent variable were included to control for autocorrelation of behavior across time.

The final models for number of sexual partners, unsafe sex with a monogamous partner, and unsafe sex with a non-monogamous partner are shown in Table 6 and Fig. 2. For number of sexual partners, Step 1 was significant, $\chi^2(5) = 527.1$, $p < .001$, with gender, number of sexual partners in high school, and sexual values making significant individual contributions. Step 2 was significant, $\chi^2(3) = 13.76$, $p = .003$, but only parental PAC × sexual values reached significance. Step 3 was not significant, $z = 1.41$. Individuals with conservative sexual values were more likely to decrease (or maintain) their number of sexual partners across all levels of parental PAC, whereas individuals with liberal sexual values were more likely to increase their number of sexual partners as levels of parental PAC increased.

For unsafe sex with a monogamous partner, Step 1 was significant, $\chi^2(4) = 127.64$, $p < .001$, with gender, occasions of unsafe sex with a monogamous partner in high school, and sexual values being significant. Neither Step 2, $\chi^2(3) = 0.74$, nor Step 3, $z = 1.47$, were significant.

For unsafe sex with a non-monogamous partner, Step 1 was significant, $\chi^2(4) = 68.15$, $p < .001$, with occasions of unsafe sex with a non-monogamous partner in high school and sexual values being significant. Neither Step 2, $\chi^2(3) = 0.84$, nor Step 3, $z = 0.28$, were significant.

Discussion

The current study tested the associations between perceived awareness and caring from parents and peers and sexual values with sexual behavior during the transition from high school to college. Although many of the social influences on sexual activity are well understood, previous studies focused exclusively on specific populations in isolation, such as adolescents (Miller, Sabo, Farrell, Barnes, & Melnick, 1998; Watts & Nagy, 2000), college students (Cooper, 2002), or at-risk groups (Barnett & Read, 2005; O'Hare, 2005). The present study extended research in this area by examining associations between sexual values and perceived awareness and caring on three indices of sexual behavior across an important developmental period between late adolescence and emerging adulthood. Results demonstrated that perceived awareness and caring exerted differential influence on sexual behavior that depended in part on source (parents vs. peers), sexual values (liberal vs. conservative), and behavior (number of partners, occasions of unsafe sex).

Sexual Values, Perceived Awareness and Caring, and Sexual Behaviors

Not surprisingly, more conservative sexual values were associated with fewer sexual partners and less frequent unsafe sex, whereas more liberal sexual values were associated with more frequent sexual behavior. Moore and Davidson (2006) reported that female college students with conservative sexual attitudes showed safer sexual behavior than their more liberal female counterparts. Men, however, typically hold more liberal sexual attitudes than women (Knox, Zusman, & Cooper, 2001), although previous research did not assess sexual behaviors in conjunction with sexual values for men.

Greater levels of perceived awareness and caring by parents and peers were also associated with fewer sexual behaviors and risks. These findings were similar to previous research on alcohol use whereby high levels of PAC were associated with fewer drinking episodes and drinks per drinking occasion in high school and first year college students (Wetherill & Fromme, 2007). Thus, high levels of PAC may have a protective effect on behavioral risks during emerging adulthood and could be an important component in prevention and intervention programs. Of note, however, was the combination of liberal sexual vales and high levels of both parental PAC and peer PAC that was associated with a greater number of sexual partners and unsafe sexual behavior. This finding could mean that PAC does not serve as a deterrent for individuals with permissive views about sexual behavior. Such an interpretation is complicated, however, by the additional finding that individuals with liberal sexual values, high parental PAC, and low peer PAC, engaged less frequently in unsafe sex. Thus, findings suggested that the combination of high levels of both parental and peer PAC, in conjunction with liberal sexual values, promoted the greatest degree of risk.

Temporal Changes from High School to College

Both parental and peer perceived awareness and caring decreased across the transition from high school to college, which is consistent with developmentally appropriate changes associated with college matriculation. As emerging adults (Arnett, 2000), students are typically establishing independence from their parents and forming new peer groups in college. These new peers may not be as familiar or supportive as the established high school social groups. In addition, lower levels of perceived awareness and caring in high school and reported greater decreases following college matriculation for men than women was consistent with the perception that men are less sexually vulnerable and more autonomous, and could mean that actual awareness and caring about their sexual behavior is lower than that for women (Kiefer &Sanchez, 2007). Moreover, men may have smaller social networks and are less aware of others' concern for their behavior, especially during stressful times (Cyranowski, Frank, Young, & Shear, 2000; Taylor et al., 2000).

Similar to changes in parental and peer awareness and caring, individuals with more liberal sexual values in high school reported greater decreases in both parental PAC and peer PAC across the transition from high school to college. Emerging adults who have non-traditional beliefs toward sexual activity may exert greater independence from their parents and peers as they enter the collegiate environment.

In general only women increased their number of sexual partners once starting college, and there was no increase in the frequency of unsafe sex for either gender. The observed gender difference in sexual partners may be the result of freshman women having more sexual opportunities with upperclass students than freshman men. For example, fresh-vvman women, but not freshman men, are allowed to attend fraternity functions on this southwestern university campus. Gender differences in the number of sexual partners have also been demonstrated in samples of younger (i.e., ages 13–15) adolescents who are sexually active (Leitenberg & Saltzman, 2003), suggesting that young women may have more overall opportunities for sex. The lack of increase in unsafe sex during college, despite increases in sexual behavior for women, may relate to the availability of contraceptives in a campus setting (e.g., through university health centers) relative to the availability during high school. Thus, those women who initiate sexual activity in college, and men who are already sexually active before college, may be more likely to obtain birth control and condoms and to use safer-sex practices in college.

Longitudinal Analysis of Sexual Values, Perceived Awareness and Caring, and Sexual Behaviors

Longitudinal trends revealed that perceived awareness and caring from parents moderated only the association between sexual values and the number of sexual partners during the past three months. As parental PAC increased, individuals with more conservative sexual values demonstrated little change or a decrease in sexual partners whereas individuals with more liberal sexual values increased their number of sexual partners. For unsafe sex with monogamous and non-monogamous partners, only sexual values and high school unsafe sexual practices predicted college unsafe sexual behavior. Thus other factors, such as personal attitudes and expectancies that were developed earlier in life, may be more

important than perceived awareness and caring for unsafe sexual behaviors in college. For example, negative attitudes toward condom use (Roberts & Kennedy, 2006), condom-use expectancies (Sheeran & Orbell, 1998; Sneed & Morisky, 1998), and lack of perceived risks of having unprotected sex (Fromme, Katz, & Rivet, 1997) were all associated with decreased condom use.

Limitations

Although this study provided insight into social influences on sexual behaviors across an important developmental transition, its limitations should be noted. First, participants were recruited only from students enrolled in a single large, public university; thus, results may not generalize to a wider population of students or to non-college bound students. The sample demographics, however, represented wide diversity, enhancing confidence in the relative representativeness of current findings to other populations. Second, the current analyses examined data from only two time points, thereby limiting conclusions to the initial transition into college. As college peer groups solidify and relationships with parents continue to mature, the role of perceived awareness and caring may shift over time. Third, only participants' perceptions of parental and peer awareness and caring were examined, as assessment of actual awareness and caring by parents and peers in such a large sample would have been prohibitive. It is possible, however, that parent and peer reports on actual awareness and caring may be less influential than the individual's perception of their knowledge and caring, even if that perception is inaccurate. This has proven to be the case for peer norms about collegiate alcohol use, whereby inaccurate perceptions influence personal alcohol consumption more strongly than actual peer alcohol use. An additional limitation included the wide range of options for non-monogamous sexual behavior (from 2 to more than 20). Future studies should employ a more specific assessment of the number of non-monogamous partners to more clearly characterize emerging adults' sexual behavior. In addition, the combined assessment of knowing and caring as one construct precluded a test of the relative contributions of perceptions of knowing and perceptions of caring. The current research, however, was based on the belief that both knowing and caring would have the strongest influence on behavior, and that these components in concert produce feelings of anonymity or scrutiny for the individual. Finally, alternative explanations for the ways in which perceived awareness and caring may influences sexual behavior have not been fully explored. For example, different levels of PAC from others could be associated with different levels of self-esteem, which could also lead to increased or decreased behavioral risks. Genetic influences could also account for associations between PAC and sexual behavior and should be examined in future research.

Implications and Conclusions

The current study contributes to the literature on the etiology of adolescent and emerging adulthood sexual behaviors, with distinct effects of both parental and peer influences on men and women during the transition from high school to college. In particular, this study highlighted the need for additional research on influences of sexual behavior during this pivotal time of change and development. Specifically, findings indicated that potentially unsafe sexual practices and subsequent increased risk for contracting STIs develop before emerging adults enter the college environment. Of the 19 million new STIs that occur each

year, almost half of them occur among people aged 15–24 (Centers for Disease Control and Prevention, 2006), which illustrates the need for early education and intervention programs for younger adolescents. In particular, it seems women may be at higher risk for STIs given the finding that women have increased numbers of sexual partners once entering college. Although instances of unsafe sex did not increase, research indicates women often misinterpret their sexual risk and engage in unsafe sexual practices under certain relationship contexts (Corbin & Fromme, 2002; Kershaw, Ethier, Niccolai, Lewis, & Ickovics, 2003).

Furthermore, sexual values were important influences on sexual behavior and, as such, should be considered when planning interventions and education programs. For example, Bay-Cheng (2001) assessed a variety of sexual education programs and found that liberal-based sex education programs were more closely aligned with emerging adults' experiences and needs. These liberal-based programs may be ideal for persons who have liberal values because their sexual behavior increases, despite parental and peer awareness and caring. In some cases, however, it would seem that safer-sex interventions may benefit with parental involvement. For individuals with more conservative values, parents may deter their youth from engaging in potentially risky sex by demonstrating their awareness of behavior and adopting a caring attitude. For individuals with more liberal sexual values, parents and universities might encourage greater involvement in groups and organizations that would increase an individual's perception of being cared about and known. In sum, these findings supported the importance of perceived awareness and caring from parents and peers in promoting safer sexual practices and reducing STIs.

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Appendix 1

Perceived awareness and caring (parents; peers)

	Never	Rarely	Sometimes	Often	Always
"During the last 3 months of your senior year in high school/past 3 months, to what extent was there an adult (e.g., parent, guardian) who knew and cared about…"					
1. Whether you drank alcohol?	①	②	③	④	⑤
2. Whether you used illicit drugs?	①	②	③	④	⑤
3. Whether you had sex (oral, vaginal, or anal)?	①	②	③	④	⑤
4. Whether you got into a physical fight or verbal argument?	①	②	③	④	⑤
5. What you were doing and who you were with when you were not in class or studying?	①	②	③	④	⑤
6. Where you were going when you went out at night and on weekends?	①	②	③	④	⑤
"During the last 3 months of your senior year in high school/past 3 months, to what extent did people in your social group know and care about…"					
1. The amount of alcohol that you drank?	①	②	③	④	⑤

	Never	Rarely	Sometimes	Often	Always
2. How often (if ever) you drank alcohol?	①	②	③	④	⑤
3. How often (if ever) you smoked marijuana?	①	②	③	④	⑤
4. Whether you used ecstasy or other designer drugs?	①	②	③	④	⑤
5. Whether you used drugs other than marijuana or designer drugs?	①	②	③	④	⑤
6. Whether you were having sex?	①	②	③	④	⑤
7. Your aggressive actions?	①	②	③	④	⑤

Appendix 2

Sexual values

	Disagree	Slightly disagree	Neither	Slightly agree	Agree
Please indicate the extent to which you agree that the following behaviors are appropriate FOR YOU					
1. It is okay for me to have more than one sexual relationship at a time (e.g., multiple ongoing sexual relationships, cheating on a significant other)	①	②	③	④	⑤
2. It is important for me to wait until marriage to have sex	①	②	③	④	⑤
3. It is okay for me to have casual sex without being in a relationship (e.g., with a friend, one-night stand)	①	②	③	④	⑤
4. It is okay for me to explore my sexual identity by having sex with members of my same gender or with both men and women	①	②	③	④	⑤
5. It is okay for me to have several sexual relationships as long as I am only in one relationship at a time	①	②	③	④	⑤

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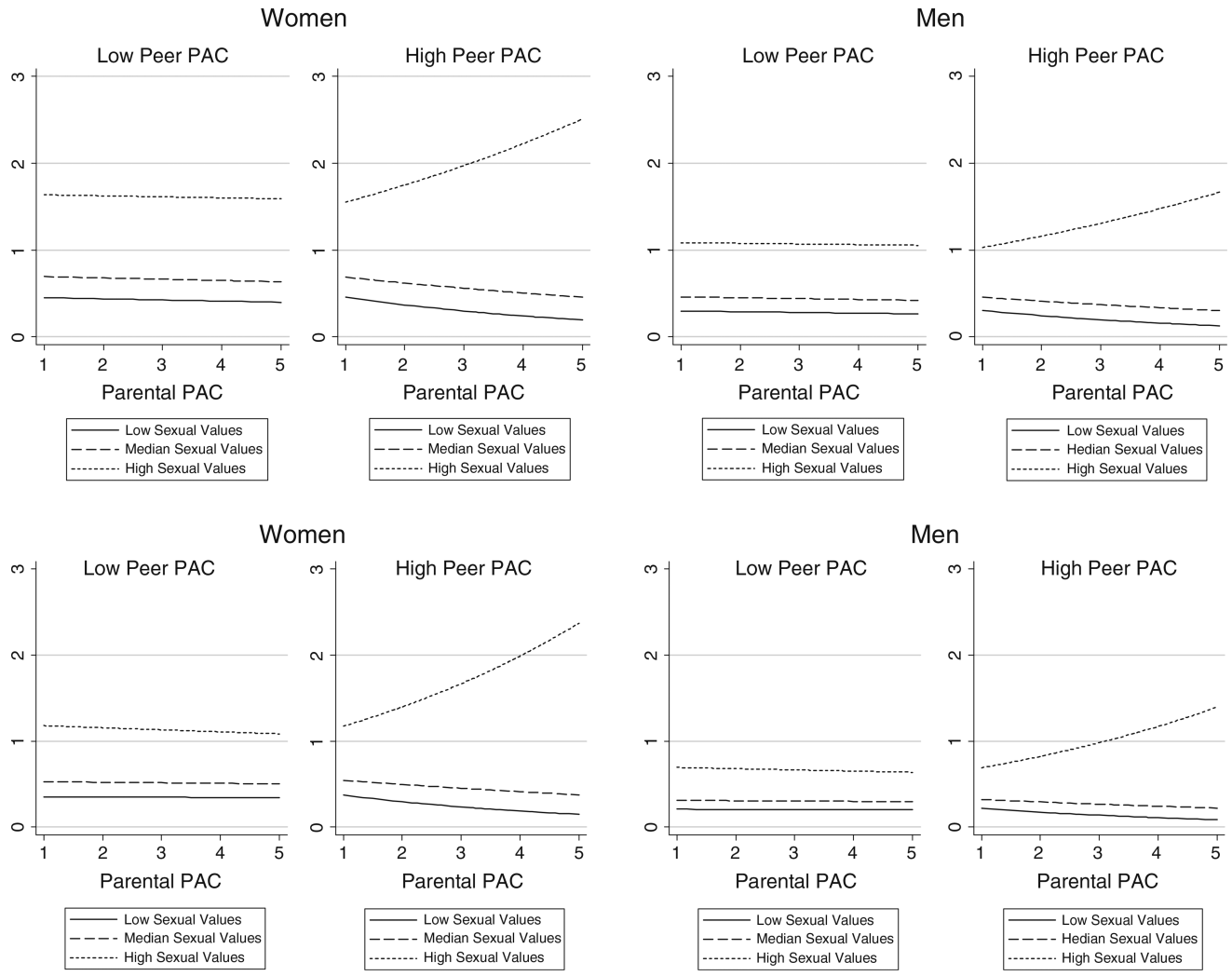

Fig. 1.

Sexual behavior as a function of sexual values, peer PAC, parental PAC, and gender. *Note*: *PAC* perceived awareness and caring; top row represents number of sexual partners, with significant parental PAC × peer PAC by sexual values interaction; bottom row represents occasions of unsafe sex with a monogamous partner with significant parental PAC × sexual values and peer PAC × sexual values interactions

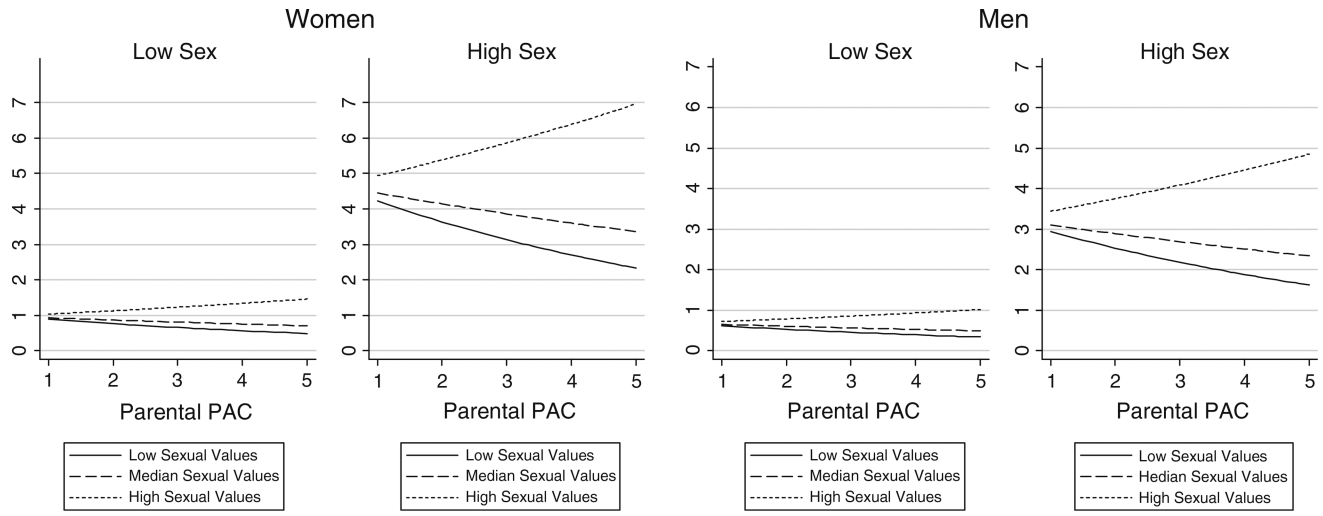

Fig. 2.

Longitudinal analyses of number of sexual partners as a function of sexual values, parental PAC, and gender. *Note*: Significant parental PAC by sexual values interaction. *PAC* perceived awareness and caring; low sex = 1 partner in high school; high sex = 4 partners in high school

Table 1

Summary statistics and comparisons between participants providing data at both time points and participants who did not

	Complete data (*n* = 1,928)		Incomplete data (*n* = 319)	
	M	**SD**	***M***	**SD**
Parental PAC	3.89_a	1.26	3.67_b	1.32
Peer PAC	3.39_a	1.31	3.08_b	1.33
Sexual values	1.93_a	0.77	2.18_b	0.84
Number of three month sexual partners	0.51	0.98	0.56	1.35
Frequency of unprotected sex with a monogamous partner	0.42	1.25	0.51	1.39
Frequency of unprotected sex with a non-monogamous partner	0.09	0.54	0.16	0.64

Note: PAC = perceived awareness and caring, higher values indicate greater perceived awareness and caring. Means in the same row that do not share letters (a and b) differ at $p < .01$. Parental PAC, Peer PAC, and sexual values variables range from 1 to 5

Table 2

Means and SDs for perceived awareness and caring items

	Women				Men			
	HS		College		HS		College	
	M	SD	*M*	SD	*M*	SD	*M*	SD
Parental PAC								
1. Drank alcohol	3.88	1.53	3.08	1.67	3.67	1.56	2.45	1.56
2. Used illicit drugs	3.72	1.75	2.87	1.84	3.54	1.74	2.36	1.66
3. Had sex (oral, vaginal, or anal)	3.58	1.73	2.78	1.77	3.26	1.73	2.17	1.54
4. Got into a physical/verbal fight	3.79	1.60	2.89	1.77	3.44	1.66	2.28	1.57
5. Where you were going…	4.54	0.95	3.44	1.51	4.25	1.11	2.76	1.48
6. What you were doing…	4.35	1.06	3.35	1.50	4.01	1.23	2.64	1.48
Peer PAC								
1. Amount of alcohol you drank	3.61	1.45	3.40	1.41	2.98	1.52	2.77	1.40
2. How often you drank alcohol	3.58	1.47	3.36	1.42	3.02	1.54	2.74	1.40
3. How often you smoked marijuana	3.65	1.59	3.16	1.65	3.00	1.66	2.57	1.57
4. Used ecstasy or other designer drugs	3.77	1.63	3.16	1.76	3.06	1.75	2.57	1.65
5. Used other drugs	3.78	1.61	3.16	1.75	3.06	1.73	2.58	1.66
6. Having sex	3.53	1.50	3.07	1.56	2.86	1.54	2.44	1.44
7. Aggressive actions	3.29	1.55	2.73	1.63	2.80	1.51	2.30	1.41

Note: PAC = perceived awareness and caring, higher values indicate greater PAC. Variables range from 1 to 5

Table 3

Associations between parental PAC, peer PAC, and sexual values with three indices of sexual behavior

	Sexual partners (past 3 months)			Unsafe sex/monogamous partner			Unsafe sex/non-monogamous partner		
	b	**SE**	***z***	***b***	**SE**	***z***	***b***	**SE**	***z***
Step 1									
Gender	−0.41***	0.07	5.94	−0.53***	0.14	3.82	−0.58**	0.21	2.77
Peer PAC	−0.06**	0.02	2.57	−0.05	0.04	1.19	−0.07	0.09	0.82
Parental PAC	−0.07***	0.02	3.70	−0.06	0.03	1.66	−0.26**	0.08	3.12
Sexual values	0.71***	0.04	19.64	0.71***	0.06	11.50	1.34***	0.10	13.44
Step 2									
Peer PAC × values	0.08***	0.02	3.55	0.11**	0.04	2.82	0.09	0.06	1.37
Parental PAC × values	0.08***	0.02	4.65	0.09**	0.03	2.72	0.20***	0.05	3.81
Peer PAC × parental PAC	−0.02*	0.01	1.98	−0.02	0.02	0.80	−0.06	0.05	1.31
Step 3									
Peer PAC × parental PAC × values	0.03*	0.01	2.20	0.04*	0.02	1.98	−0.04	0.03	1.18

Note: Gender coded 0 = female and 1 = male. PAC = Perceived awareness and caring, higher values indicate greater PAC; Values = Sexual values, higher values indicate more liberal views. Statistics are from the final models.

* $p < .05$.

** $p < .01$.

*** $p < .001$

Table 4

Descriptive and inferential statistics for peer PAC, parental PAC, sexual values, number of sexual partners, occasions of unsafe sex with monogamous partners, and occasions of unsafe sex with non-monogamous partners

	Women				Men				Inference tests		
	HS		College		HS		College		Gender	Time	Gender × time
	M	SD	*M*	SD	*M*	SD	*M*	SD			
Parental PAC	4.0	1.2	3.1	1.5	3.7	2.5	2.5	1.4	75.0***	961.8***	28.6***
Peer PAC	3.6	1.2	3.2	1.3	3.0	1.3	2.6	1.2	133.3***	157.9***	0.1
Number of partners	0.5	0.8	0.7	0.9	0.5	1.3	0.5	1.0	1.4	10.2**	5.68*
Unsafe sex with monogamous partners	0.5	1.3	0.4	1.3	0.3	1.2	0.3	1.2	NA	NA	NA
Unsafe sex with non-monogamous partners	0.1	0.6	0.1	0.4	0.1	0.5	0.1	0.5	NA	NA	NA

Note: PAC = perceived awareness and caring, higher values indicate greater PAC; NA = not applicable; inference tests are *F* values and χ^2

* $p < .05$;

** $p < .01$;

*** $p < .001$

Table 5

Longitudinal associations predicting college PAC

	Parental PAC			Peer PAC		
	b	**SE**	***t*(1, 924)**	***b***	**SE**	***t*(1, 924)**
Step 1						
Gender	−0.45	0.06	7.12***	−0.30	0.06	5.29*
High school PAC	0.44	0.03	17.55***	0.37	0.02	17.36*
Sexual values	−0.22	0.04	5.92***	−0.15	0.03	4.82*
Step 2						
High school PAC × sexual values	−0.05	0.03	1.73	−0.03	0.03	1.46
Gender × high school PAC	−0.07	0.05	1.30	0.03	0.07	1.18
Gender × sexual values	−0.03	0.07	0.34	0.08	0.04	0.73
Step 3						
High school PAC × sexual values × gender	−0.02	0.06	0.39	−0.08	0.05	1.54

Note: PAC = perceived awareness and caring, higher values indicate greater PAC

* $p < .05$;

** $p < .01$;

*** $p < .001$

Table 6

Longitudinal associations between parental PAC, peer PAC, and sexual values with three indices of sexual behavior

	Sexual partners (past 3 months)			Unsafe sex/monogamous partner			Unsafe sex/non-monogamous partner		
	b	**SE**	***z***	***b***	**SE**	***z***	***b***	**SE**	***z***
Gender	−0.36***	0.07	5.16	−0.61***	0.21	2.96	0.02	0.29	0.07
Lagged value	0.52**	0.03	16.34	0.87***	0.11	7.83	0.81**	0.28	2.92
Sexual values	0.32***	0.04	8.10	0.69***	0.13	5.26	0.91***	0.18	4.99
Peer PAC	−0.01	0.03	0.30	−0.10	0.08	1.16	−0.21	0.12	1.70
Parental PAC	−0.07*	0.03	2.39	−0.12	0.08	1.45	−0.17	0.12	1.37
Peer PAC × parental PAC	−0.01	0.02	0.50	0.00	0.06	0.06	−0.07	0.09	0.73
Peer PAC × values	0.05	0.03	1.66	−0.13	0.11	1.19	0.03	0.16	0.18
Parental PAC × values	0.09***	0.03	3.25	−0.02	0.10	0.24	0.08	0.15	0.53
Peer PAC × parental PAC × values	0.03	0.02	1.41	−0.11	0.07	1.47	0.03	0.12	0.28

Note: Gender was coded 0 = female and 1 = male. PAC = Perceived awareness and caring, higher values indicate greater PAC; Values = Sexual values, higher values indicate more liberal views. Statistics reported are from the final statistical models

* $p < .05$;

** $p < .01$;

*** $p < .001$