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Attachment Orientations and Daily Condom Use in Dating Relationships

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This daily experience study examined the roles of attachment orientations and daily relationship satisfaction in shaping daily condom use among college students in dating relationships. Seventy-five participants completed an initial measure of attachment orientation and then reported their relationship satisfaction and condom use each day for 14 consecutive days. The results showed that attachment anxiety was associated with less frequent use of condoms on a daily basis. Daily satisfaction was also associated with a decreased likelihood of using condoms, and this association was stronger for those high in attachment anxiety and mitigated for participants high in attachment avoidance. The associations between attachment orientations and daily condom use remained significant when controlling for important covariates including participant gender, use of another form of birth control, frequency of sex, and knowledge of a partner's sexual history. Implications for sexual risk-taking behaviors and future research using daily diary methods to study sexuality in intimate relationships are discussed.

Nearly one half of all sexually active adolescents and young adults are currently engaging in unprotected sexual intercourse (Centers for Disease Control, 2006). In the United States, young adults are at heightened risk for contracting sexually transmitted infections (STIs) such as HIV, chlamydia, and gonorrhea (Weinstock, Berman, & Cates, 2004). Recent estimates suggest that, although 15- to 24-year-olds represent only 25% of individuals who have ever been sexually active, they acquire nearly one half of all new STIs (Weinstock et al., 2004). In response, the public health community has set increasing condom use among young adults as one of its top priorities for the decade (Department of Health and Human Services, 2000).

Young adults are more likely to have unprotected sex in ongoing, dating relationships than in newly developing relationships or with casual sexual partners (e.g., Fortenberry, Wanzhu, Harezlak, Katz, & Orr, 2002; see also a review by Misovich, Fisher, & Fisher, 1997). Recent research has, therefore, begun to explore the role of specific relational factors, such as interpersonal trust and commitment, in shaping condom use behavior (see a review by Noar, Zimmerman, & Atwood, 2004). Factors that have been given surprisingly little research attention concern peoples' patterns of attachment-related security

and insecurity in romantic relationships (i.e., attachment orientations) and relationship satisfaction the day of the sexual interaction. In this study, we examine the influence of people's attachment orientations, as well as their daily feelings of relationship satisfaction, on daily condom use in dating relationships. We begin by presenting a brief overview of attachment theory and romantic relationships. Next, we review existing research on attachment orientations, sexuality, and condom use, as well as how aspects of the daily relationship climate may influence the association between attachment and condom use. Then, we describe the results of a 14-day daily experience study that we conducted to test our hypotheses. Finally, we discuss implications for sexual risk-taking behaviors, as well as future research using daily diary methods.

Attachment Theory

Attachment theory (Bowlby, 1980, 1969/1982, 1973) was first proposed as a way to explain the motivation of infants to rely on their caregivers. Hazan and Shaver (1987) extended the research on attachment to caregivers to the realm of romantic relationships, proposing that romantic partners can also serve as attachment figures. Similar to Bowlby's (1969/1982) original formulation of attachment theory in which caregivers shape an infant's emotions and behaviors, an important

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component of adult attachment theory is the idea that, in adulthood, a romantic partner's responsiveness can also shape an individual's interaction goals, relational cognitions, and interpersonal behaviors (see a review by Mikulincer & Shaver, 2007). Individuals who have responsive and available attachment figures during times of need experience attachment security and optimal functioning. These individuals are able to develop positive internal working models of relationships (i.e., mental representations of how attachment-related interactions should be handled by the individual and attachment figures). In contrast, individuals with attachment figures who are unresponsive, unavailable, and unreliable fail to develop attachment security and, instead, develop less than optimal strategies for dealing with stressful situations. These individuals have negative internal working models of relationships.

Individual differences in attachment orientations are currently viewed as a continuous, two-dimensional model (Brennan, Clark, & Shaver, 1998; Brennan & Shaver, 1995; Fraley & Waller, 1998). One dimension, attachment anxiety, refers to an individual's fears that attachment figures will be unavailable and unsupportive during times of need. Individuals who are high in attachment anxiety engage in behaviors to secure the proximity and supportiveness of others, and use hyperactivating strategies when they experience distress. The second dimension, attachment avoidance, refers to an individual's general distrust that close others will be available and responsive during times of need. Individuals who are high in attachment avoidance attempt to create independence and emotional distance from attachment figures and employ deactivating strategies when their attachment system is activated. Individuals who report low levels of both anxiety and avoidance are considered securely attached.

Numerous studies have investigated the association between attachment orientations and the quality and stability of romantic relationships. Research has consistently shown that individuals with a secure attachment orientation report having more satisfying and stable relationships characterized by more commitment, intimacy, and trust than those higher in attachment avoidance, attachment anxiety, or both (Hazan & Shaver, 1987; Kirkpatrick & Davis, 1994; Simpson, 1990; for a review, see Shaver & Mikulincer, 2006a). Individuals high in attachment avoidance generally experience less satisfying relationships than those low in attachment avoidance (Brennan & Shaver, 1995; Feeney, 1994; Simpson, 1990). Furthermore, avoidant individuals are also more likely than their securely or anxiously attached counterparts to initiate breakups due to fears that they are becoming too dependent on their romantic partners (e.g., Collins & Read, 1990; Hazan & Shaver, 1987; Kirkpatrick & Davis, 1994). In contrast, individuals high in attachment anxiety report being involved in less satisfying but relatively stable relationships (Campbell, Simpson, Boldry, & Kashy, 2005; Feeney,

1994; Kirkpatrick & Davis, 1994). The stability of these relationships arises from these individuals' high emotional needs that make breaking up unthinkable (e.g., Collins & Read, 1990; Kirkpatrick & Davis, 1994).

Attachment Orientations, Sexuality, and Condom Use

Attachment theorists have proposed that romantic love consists of three innate behavioral systems: attachment, caregiving, and sex (Bowlby, 1969/1982; Shaver, Hazan, & Bradshaw, 1988). Specifically, researchers suggest that the attachment system and the sexual system are closely linked (Shaver & Mikulincer, 2006b), such that sexual experiences can serve attachment functions by promoting proximity to a romantic partner and promoting bonding and intimacy in a relationship (Hazan & Zeifman, 1994; Schachner & Shaver, 2004). The links between attachment and sexuality may be particularly important during adolescence and young adulthood—a time during which young people are developing interests in exploring their sexuality. Given the theoretical overlap between the attachment system and the sexual system, recent research has begun to examine the role of attachment orientations in shaping sexual goals, attitudes, and behaviors (e.g., Impett & Peplau, 2002; Birnbaum, Reis, Mikulincer, & Gillath, 2006; Davis, Shaver, & Vernon, 2004; Gentzler & Kerns, 2004; Schachner & Shaver, 2004).

In general, research has shown that people who score high on the dimension of attachment anxiety are more likely to engage in sexual activities to reassure themselves that their partner cares about them (e.g., Davis et al., 2004; Schachner & Shaver, 2004), sometimes even consenting to sexual activity that they do not particularly desire to avoid disapproval or rejection (Impett & Peplau, 2002). In addition, research has shown that attachment anxiety is associated with low sexual self-efficacy, fears that requests for sexual discussions will alienate partners, and a preference for the affectionate and intimate aspects of sexuality over the genital aspects (e.g., Feeney, Peterson, Gallois, & Terry, 2000; see also a review by Feeney & Noller, 2004). In contrast, people who score high on the dimension of attachment avoidance tend to be less comfortable with sexual intimacy and are, therefore, more likely to either avoid sexual intercourse altogether or engage in casual sexual relationships (e.g., Brennan & Shaver, 1995; Gentzler & Kerns, 2004). In short, insecurely attached individuals (i.e., those high in anxiety or avoidance) often report involvement in more short-term relationships and a greater number of sexual partners than more securely attached individuals (Bogaert & Sadava, 2002).

These different views of relationships may also influence if and when a condom is used during sexual interactions. Many young people express concerns that

discussing the use of condoms might cause their partners to perceive them negatively and potentially damage their relationships (Hammer, Fisher, Fitzgerald, & Fisher, 1996; Misovich et al., 1997). Thus, individuals who are high in attachment anxiety and fear rejection by a romantic partner may be less inclined to use condoms due to fears of disappointing their partner or beliefs that condoms will decrease intimacy in their relationships. In contrast, people who are high in attachment avoidance and have difficulty trusting and depending on others may be more inclined to use a condom as a way to guard against unwanted sexual intimacy. Indeed, many people perceive offering or accepting the use of a condom as indicating a lack of desire for intimacy (Kline, Kline, & Oken, 1992). Thus, avoidance attachment may be associated with an increased likelihood of using condoms.

Previous research linking attachment orientations and condom use has been limited and has shown mixed results. For example, in two cross-sectional studies of college students, attachment anxiety was associated with less frequent or consistent use of condoms among both men and women (Feeney, Kelly, Gallois, Peterson, & Terry, 1999; Feeney et al., 2000). In another study, however, attachment anxiety was associated with more frequent use of condoms (Bogaert & Sadava, 2002). Research has also shown mixed results concerning the role of attachment avoidance in shaping condom use. In one study, men who scored higher in attachment avoidance were more likely to use condoms every time they engaged in sexual intercourse than men who scored lower in avoidance (Feeney et al., 2000). In another study, however, attachment avoidance was unrelated to condom use for both women and men (Bogaert & Sadava, 2002). Unfortunately, none of these studies focused specifically on condom use in ongoing, dating relationships. In this study, we attempted to reconcile these differing findings by specifically focusing on the role of attachment orientations in shaping condom use behavior in the context of ongoing, dating relationships.

Daily Satisfaction and Condom Use

Recent research has also begun to explore the role of people's feelings of relationship satisfaction in influencing condom use behavior. For example, several cross-sectional studies have shown that higher feelings of relationship satisfaction and commitment are associated with lower rates of condom use (e.g., Katz, Fortenberry, Zimet, Blythe, & Orr, 2000; Saul et al., 2000). Further, couples in happy relationships tend to discount negative information and interpret their partner's behaviors in the best possible light (Fincham & Bradbury, 1987), suggesting that people who feel relatively satisfied in their relationships may perceive their partner as "safe" and feel no need to use condoms (Misovich et al., 1997).

Feelings of satisfaction in relationships are not always high or low, and may vary from day to day—that is, whereas on some days couples experience many positive events and feel more intimacy, on other days, they may feel more distant or engage in conflict (Gable & Haidt, 2005). In romantic relationships, people engage in sexual intercourse to express a variety of emotions and to meet a variety of needs (Cooper, Shapiro, & Powers, 1998; Hill & Preston, 1996). People do not merely have sex on days when they are happy with their relationships. Instead, on some days people engage in sex to prevent negative outcomes, such as an argument or relationship conflict (e.g., Impett, Peplau, & Gable, 2005). Just as the sexual interaction itself may occur on a day when relationship satisfaction is high or low, the use of a condom may also vary as a function of the perceived level of relationship quality. No research to date has examined how fluctuations in daily relationship satisfaction are related to daily changes in condom use behavior. Another goal of this study was to extend previous cross-sectional research linking relationship satisfaction with decreased condom use by examining how feelings of *daily* relationship satisfaction are associated with condom use behavior in intimate relationships. In addition, attachment processes may heighten or diminish the effect of daily relationship satisfaction on daily condom use. For example, days with high relationship satisfaction may yield less condom use, particularly for those with an already strong aversion to using condoms (i.e., those high in attachment anxiety). Similarly, days with high relationship satisfaction may no longer show a robust influence on condom use for those with an already strong inclination toward using condoms (i.e., those high in attachment avoidance).

Other Contributors to Condom Use

Condom use is influenced by a variety of factors that may also be significant within intimate relationships. Use of another form of birth control is frequently reported as a reason for not using condoms (Sheeran, Abraham, & Orbell, 1999). Research has suggested that a "contraceptive switch" occurs in relationships such that partners begin their relationships by using condoms but, as the relationship progresses, they move to a hormonal contraceptive method, such as birth control pills (Civic, 2000; Hammer et al., 1996). As such, we include the use of another form of birth control as a covariate in this study. Other possible contributors to condom use include sexual frequency and perceived knowledge of the partner's sexual history. Greater frequency of sexual intercourse has been associated with less consistent condom use (Sheeran et al., 1999), and in one study, the top reason that college students did not use a condom was that they claimed to know their partner's sexual history (Civic, 2000). We included each of these factors (i.e., use

of another birth control method, participant gender, sexual frequency, and knowledge of a partner's sexual history) as covariates in all of the study analyses.

Overview of This Study

Although several important studies have begun to investigate the links between attachment and condom use, this research has been limited in two important ways. First, existing research linking attachment orientations with condom use has relied almost entirely on cross-sectional, retrospective reports of sexuality and sexual behavior (e.g., Bogaert & Sadava, 2002; Feeney et al., 1999), despite the risk of retrospective bias when assessing condom use through cross-sectional self-report designs (Croyle & Loftus, 1993). Second, as previously mentioned, the existing research on this topic has not focused specifically on dynamics in ongoing, intimate relationships.

This study addresses both of these limitations with two central objectives. First, this study uses a daily experience method to obtain daily reports of condom use in dating relationships every day for 14 consecutive days. These daily reports are designed to minimize retrospective bias and to provide more detailed, accurate information about condom use in dating relationships (Graham, Catania, Brand, Duong, & Canchola, 2003). Specifically, a daily diary can use a clear dichotomous assessment ("yes" or "no") in place of an ordinal assessment ("always use a condom," "sometimes use a condom," "never use a condom"), which is subject to individual interpretation (Cecil, Pinkerton, Bogart, Pavlovic, & Kimball, 2005). Second, this study focuses specifically on attachment dynamics, relationship quality, and condom use in the context of ongoing, dating relationships, which has not been done previously. Based on theory and previous research, we predicted that attachment anxiety would be associated with less frequent use of condoms (i.e., more unprotected sex), and attachment avoidance would be associated with more frequent use of condoms. Furthermore, daily relationship satisfaction will be associated with less use of condoms, and attachment dimensions will moderate this association, such that this association will be even more magnified for people high in attachment anxiety and diminished for people high in attachment avoidance.

Method

Participants and Procedures

The study was advertised as an examination of "Relationships, Sexuality, and Health" to students in psychology courses. The participants were told the study was about daily events in relationships and many

different relationship events would be assessed. However, to examine multiple sexual interactions within-subjects, participants were prescreened and recruited based on answering "yes" to the following three questions: (a) Are you currently in a relationship? (b) Are you sexually active with your current partner? (c) Will you see your partner at least five times during the next 2 weeks? Participants were not told they were recruited to participate based on their responses to these questions until debriefing.

Ninety participants (60 women, 29 men, 1 did not report gender) completed the study for course credit. Fifteen participants did not engage in sexual intercourse during the study and, therefore, did not have the opportunity to use (or not use) a condom. Only participants who engaged in at least one sexual interaction during the course of the study ($N=75$) were included in the analyses. Notably, 3 of the participants who were dropped to meet this criterion were the only married participants in the original sample. The final analysis sample was 71% women and ethnically diverse: 3% of the participants were African American, 27% were Asian or Pacific Islander, 29% were Caucasian, 14% were Hispanic, 23% self-identified as multi-ethnic or "other," and 4% did not report their race or ethnicity. Participants ranged in age from 18 to 44 ($M=20.13$, $SD=3.35$) and had been dating their partner for an average of 19 months ($SD=19$ months; range = 1–135 months). Table 1 further illustrates the gender and birth control use for participants who were removed from the original sample and those who were included in the final analytic sample.

During an initial session in the laboratory, participants completed a questionnaire with basic demographic information (i.e., gender, age, ethnicity, relationship duration), attachment orientations, and measures of past sexual behavior. At this time, they were instructed to complete an online survey by logging onto a secure server each day (beginning the next day). The daily survey was posted on a Web site, and each participant was given a login name and password to use each time they entered the site. Because most sexual activity occurs in the evening, participants were asked to complete the survey at the beginning of each day for 14 consecutive days, and the survey asked about the previous day's relationship and sexual activities. Participants were instructed to complete the survey by 1 p.m.

Table 1. Descriptives of the Original Sample and the Analytic Sample

Variable	Original Sample ($N=90$)	Analytic Sample ($N=75$)
No sex during study	15	0
Female	60	53
Other birth control	33	33

each day. The date and time of survey completion was automatically recorded by the Web site, and research assistants checked this log each morning and e-mailed reminders to participants who had not yet completed their daily surveys. Only surveys completed on time were accepted and included in the data analyses. All participants received course credit; however, as an incentive for on-time completion of surveys, participants who completed between 11 and 14 diaries ($N=81$) were entered into a lottery drawing for \$100. Participants completed a total of 1,182 daily surveys on time, an average of 13 days per person. Ninety percent of participants completed all their surveys on time.

Background Measures of Sexual Behavior

Participants were asked an open response question about their primary form of birth control (e.g., condoms or oral contraceptives, such as the pill). Thirty-six participants reported condoms as their primary form of birth control; 30 reported oral contraceptives, the patch, or Depo-Provera; 4 used the “pull out” method; 2 used diaphragms; 2 reported “none”; and 1 person had a hysterectomy. We created a variable called “otherbirth” to control for the use of other birth control methods. Participants who reported using other forms of birth control (i.e., oral contraceptives, Depo-Provera, diaphragm, and hysterectomy; $N=33$) were assigned a “1” on this variable, whereas participants who did not use another form of birth control (i.e., condoms, pull out, none; $N=42$) were assigned a “0” on this variable. Participants were also asked how well they know their partner’s sexual history, on a 5-point scale ranging from 1 (*not at all*) to 5 (*very well*) ($M=4.28$, $SD=1.12$).

Subject-Level Measure of Attachment

Attachment anxiety and avoidance were assessed with the 36-item Experiences in Close Relationships Scale developed by Brennan et al. (1998). Participants responded to such statements as “I need a lot of reassurance that I am loved by my partner” (anxiety, 18 items, $\alpha=.87$), and “I try to avoid getting too close to my partner” (avoidance, 18 items, $\alpha=.92$) on 7-point scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Daily Measures

Relationship satisfaction. Participants were asked to answer the following question on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*): “Yesterday, how satisfied were you with your relationship?”

Sexual intercourse. Participants were asked if they engaged in sexual intercourse since their last survey with

a yes–no response. Participants engaged in sex an average of 3.67 times (range = 1–14 times) during the study.

Condom use. If participants engaged in sexual intercourse since their last survey, they were asked if they used a condom during this sexual interaction with a yes–no response. Of the participants who reported using another form of birth control, 25 never used condoms during the study, and 4 used condoms every time. Of those who reported not using another form of birth control, 9 participants never used condoms during the study, and 20 used condoms every time. The average condom use (regardless of other birth control use) was 42% of the time.

Results

Data Analysis Plan

A primary goal of this study was to examine the joint influence of attachment orientations and daily relationship satisfaction on daily condom use. Traditional analysis of variance methods assume independence of observations—a criterion that is clearly violated when the same individual completes the same measures repeatedly over several days. Therefore, the data were analyzed using hierarchical linear modeling (HLM) techniques (HLMwin v.6.02; Raudenbush, Bryk, Cheong, & Congdon, 2000). HLM provides independent estimates of the associations among constructs at the lower level (within-subjects) and models them at the upper level (between-subject) as a random effect using maximum likelihood estimation. A strength of HLM techniques is that they can readily handle an unbalanced number of cases per person (e.g., number of diaries provided or number of days on which individuals engaged in sex), giving greater weighting to participants who provide more data (Reis & Gable, 2000; Snijders & Bosker, 1999).

Attachment Orientations and Daily Condom Use

The first set of hypotheses concern the association between attachment orientations and daily condom use. Because condom use is dichotomous, the hypotheses were evaluated with logistic HLM (Snijders & Bosker, 1999). We coded condom use as 1 (*no condom used*) and 0 (*condom used*) to aid in the interpretation of the odds ratio (OR) coefficients. As such, in all analyses presented, positive coefficients indicate that a particular variable is associated with a greater likelihood of engaging in *unprotected* sexual intercourse (i.e., no condom used). The equations to test the association between attachment orientations and daily condom use are as follows:

$$\text{Prob}(Y_{ij}(\text{NO-CONDOM}) = 1 | b_0) = p_j \quad (\text{Level 1})$$

$$\log[p/(1 - p)] = b_0 \quad (\text{Level 1})$$

$$b_0 = g_{00} + g_{01} * (\text{AVOID}) + g_{02} * (\text{ANXIOUS}) + g_{03} * (\text{OTHERBIRTH}) + u_0 \quad (\text{Level 2})$$

In the Level-1 equations, condom use is the dependent variable Y for Level-1 unit *i* in group *j*, and has a probability “p” for outcome “1” (no condom was used) and probability “1 – p” for outcome “0” (condom was used). In addition, *b*₀ refers to the intercept (condom use on an average day). In the Level-2 equation, *g*₀₁ represents the slope between avoidant attachment and condom use, *g*₀₂ represents the slope between anxious attachment and condom use, *g*₀₀ refers to the degree to which variations from the sample’s mean avoidant and anxious attachment scores were predictive of daily condom use, and *g*₀₃ represents whether the participant uses another form of birth control. Condom use was calculated as a function of the entire sample and error (*u*). In addition, the probability of using a condom as compared to the probability of not using a condom, or the log odds, was also calculated. When the probability is *p*_{*j*}, the odds are *p*/(1–*p*). In the results, we report both the coefficient representing the probability of not using a condom (i.e., having unprotected sexual intercourse), as well as the OR and confidence interval (CI) of this probability. All coefficients reported represent unstandardized HLM coefficients.

The results of this analysis showed that, as predicted, use of another form of birth control was associated with daily condom use (*coef*=2.24, OR = 9.44, 95% CI = 3.65, 24.37, *p* < .001), suggesting that participants using another form of birth control were 9.44 times as likely to have unprotected sexual intercourse with their partner than participants not currently taking another form of birth control. In addition, attachment anxiety was associated with having unprotected sexual intercourse (*coef*=0.46, OR = 1.58, 95% CI = 1.06, 2.37, *p* < .05), suggesting that for each unit increase in attachment anxiety, participants were 1.58 times as likely to have unprotected sex during their daily sexual interactions. Contrary to predictions, attachment avoidance was not associated with daily condom use (*coef*= – 0.12, OR = 0.88, 95% CI = 0.58, 1.35, *p* = .56).

We then conducted a follow-up analysis in which we simultaneously controlled for participant gender, knowledge of a partner’s sexual history, frequency of sexual activity, and daily relationship satisfaction (see Table 2). The results showed that of these covariates, only sexual frequency predicted daily condom use, such that the more frequently participants engaged in sex with their partners, the more likely they were to have unprotected sex. More important, after controlling for these variables, attachment anxiety remained a significant predictor of daily condom use. Finally, the

Table 2. Condom Use as a Function of Attachment Style and the Covariates in Hierarchical Linear Modeling Analyses

Variable	Coef.	Odds Ratio	Confidence Interval
Anxiety	0.44*	1.55	1.06, 2.25
Avoidance	–0.06	0.95	0.61, 1.45
Other birth control	2.07**	7.96	3.51, 18.08
Gender	0.48	1.61	0.49, 5.32
Knowledge	–0.17	0.85	0.62, 1.16
Sexual frequency	0.35**	1.42	1.22, 1.66

Note. Coef. = unstandardized hierarchical linear modeling coefficients. Condom use was coded as 0 (*condom used*) and 1 (*no condom used*). **p* < .05. ***p* < .001.

interaction between attachment anxiety and attachment avoidance in predicting daily condom use was not significant (*coef*=0.18, OR = 1.20, 95% CI = 0.66, 2.18, *p* = .55).

Daily Satisfaction and Daily Condom Use

The second hypothesis concerned the association between daily relationship satisfaction and daily condom use. The equations to test the association between attachment orientations and daily condom use are as follows:

$$\text{Prob}(Y_{ij}(\text{NO-CONDOM}) = 1|b_0) = p_j \quad (\text{Level 1})$$

$$\log[p/(1 - p)] = b_0 + b_1 * (\text{SATISFACTION}) + r \quad (\text{Level 1})$$

$$b_0 = g_{00} + g_{01} * (\text{OTHERBIRTH}) + u_0 \quad (\text{Level 2})$$

$$b_1 = g_{10} \quad (\text{Level 2})$$

In these equations, *b*₁ represents the slope between condom use and relationship satisfaction, and the degree to which an individual’s relationship satisfaction on the *i*th day deviated from his or her average level of relationship satisfaction. Thus, person *j*’s condom use on the *i*th day was predicted from his or her average condom use and relationship satisfaction (on the *i*th day) weighted by its coefficient (*b*_{1*j*}), and error. As before, *g*₀₁ in the upper level model represented use of another form of birth control by the participant.

As predicted, the results of this analysis showed that on days when participants experienced high levels of relationship satisfaction, they were significantly more likely to have unprotected sexual intercourse (*coef*=0.34, OR = 1.40, 95% CI = 1.13, 1.73, *p* < .01), suggesting that for each unit increase in relationship satisfaction on a given day, participants were 1.40 times as likely to have unprotected sex during that day’s sexual interaction. We also conducted a follow-up analysis in which we controlled for participant gender,

Table 3. Condom Use as a Function of Daily Relationship Satisfaction and the Covariates in Hierarchical Linear Modeling Analyses

Variable	Coef.	Odds Ratio	Confidence Interval
Daily satisfaction	0.37*	1.44	1.13, 1.85
Other birth control	2.09**	8.04	3.60, 17.99
Gender	0.34	1.43	0.43, 4.80
Knowledge	-0.28	0.76	0.55, 1.06
Sexual frequency	0.36**	1.44	1.21, 1.71

Note. Coef. = unstandardized hierarchical linear modeling coefficients. Condom use was coded as 0 (condom used) and 1 (no condom used). * $p < .01$. ** $p < .001$.

knowledge of a partner’s sexual history, and frequency of sexual activity. After controlling for these variables, daily relationship satisfaction remained a significant predictor of daily condom use (see Table 3).

Attachment as a Moderator Between Daily Relationship Satisfaction and Condom Use

The third set of hypotheses concerned the role of attachment as a moderator of the association between daily relationship satisfaction and daily condom use. To test these hypotheses, we added the two attachment dimensions to Level 2 as additional moderating variables in the equations previously described. Results showed that attachment anxiety (marginally) moderated the association between daily satisfaction and daily condom use ($coef = 0.19$, $OR = 1.21$, $95\% CI = 1.00, 1.46$, $p = .053$). As shown in Figure 1, daily relationship satisfaction was unrelated to daily condom use for people low in attachment anxiety. However, people who scored high in attachment anxiety were more likely to have unprotected sex on days when they were highly satisfied with their relationships than on days when they reported lower levels of relationship satisfaction. In addition,

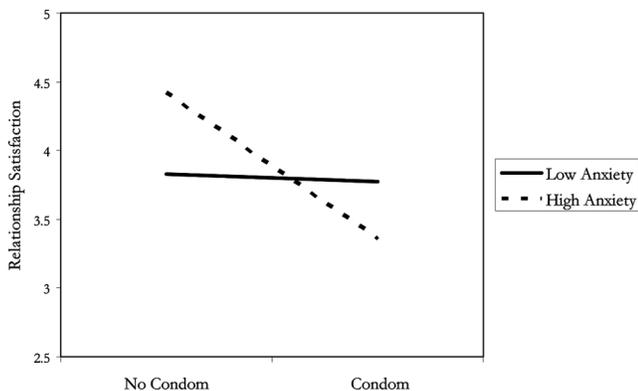


Figure 1. Attachment anxiety as a moderator of the association between daily relationship satisfaction and daily condom use. Note. The low anxiety group was estimated 1 SD below the mean, and the high anxiety group was estimated 1 SD above the mean.

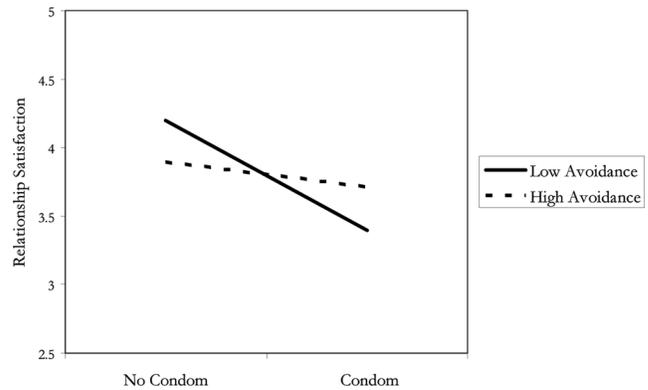


Figure 2. Attachment avoidance as a moderator of the association between daily relationship satisfaction and daily condom use. Note. The low avoidance group was estimated 1 SD below the mean, and the high avoidance group was estimated 1 SD above the mean.

attachment avoidance significantly moderated the association between daily satisfaction and daily condom use ($coef = -0.20$, $OR = 0.82$, $95\% CI = 0.71, 0.95$, $p < .01$). As shown in Figure 2, daily relationship satisfaction was unrelated to daily condom use for people high in attachment avoidance. However, people who scored low in attachment avoidance were more likely to have unprotected sex on days when they were highly satisfied with their relationships than on days when they experienced lower levels of relationship satisfaction. In short, attachment anxiety marginally strengthened the association between daily satisfaction and an increased likelihood of having unprotected sex, whereas attachment avoidance mitigated this association. When participant gender, knowledge of a partner’s sexual history, frequency of sexual activity, and daily relationship satisfaction were added as covariates, the attachment anxiety moderation effect became significant and the attachment avoidance moderation effect remained significant (see Table 4).

Table 4. Likelihood of Condom Use as a Function of Both Daily Relationship Satisfaction and Attachment Style in Hierarchical Linear Modeling Analyses

Variable	Coef.	Odds Ratio	Confidence Interval
Anxiety	0.44*	1.56	1.06, 2.28
Avoidance	-0.07	0.94	0.61, 1.46
Daily satisfaction	0.46*	1.59	1.22, 2.07
Anxiety × Satisfaction	0.24*	1.28	1.02, 1.60
Avoidance × Satisfaction	-0.26**	1.29	1.06, 1.57
Other birth control	2.10***	8.14	3.54, 18.69
Gender	0.48	1.61	0.47, 5.47
Knowledge	-0.18	0.83	0.61, 1.15
Sexual frequency	0.36***	1.43	1.22, 1.68

Note. Coef. = unstandardized hierarchical linear modeling coefficients. Condom use was coded as 0 (condom used) and 1 (no condom used). * $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

Recent research has begun to investigate links between the attachment and sexual systems in adult romantic relationships (e.g., Impett & Peplau, 2002; Birnbaum et al., 2006; Cooper et al., 1998; Davis et al., 2004; Schachner & Shaver, 2004), including how attachment orientations may shape the use of condoms (e.g., Bogaert & Sadava, 2002; Feeney et al., 1999). Much of this work has been largely cross-sectional, has not focused specifically on dating or intimate relationships, and has yielded mixed results. This research sought to extend this important work by investigating associations between people's attachment orientations and their condom use during daily sexual interactions in a daily experience study of young adults in dating relationships.

The results of this study show that attachment orientations and daily relationship satisfaction contribute to the use of condoms during daily sexual interactions. People who were high in attachment anxiety were less likely to use condoms on a day-to-day basis than participants with lower levels of anxiety. It is not surprising that people who are highly anxious about their relationships are reluctant to raise issues concerning safer sex, as they may view these behaviors as potentially limiting intimacy and jeopardizing the future of their relationships.

Consistent with previous cross-sectional research linking relationship satisfaction with less frequent condom use (e.g., Katz et al., 2000; Saul et al., 2000), we found that daily feelings of relationship satisfaction were associated with an increased likelihood of having unprotected sex on a daily basis. Further, this association was even greater for highly anxious participants. These results suggest that on days when people experience greater feelings of relationship satisfaction, anxiously attached individuals' reluctance or aversion to use condoms may grow even stronger, perhaps as a way to maintain positive feelings in their relationships.

In contrast to predictions, attachment avoidance was not associated with daily condom use. Previous cross-sectional work has revealed mixed findings regarding the association between attachment avoidance and condom use, sometimes documenting an association and other times failing to find such an association (e.g., Bogaert & Sadava, 2002; Feeney et al., 2000). However, the results of this study suggest that it is important to take the daily relationship context into account. More specifically, this study only documented an association between relationship satisfaction and condom use for participants low in attachment avoidance. On days when participants felt highly satisfied with their relationships, they were less likely to use condoms, but only among participants low in attachment avoidance. It may be that highly avoidant individuals' fears or dislike of sexual intimacy may actually increase their inclinations toward using condoms on high satisfaction days.

It is also noteworthy that all of these associations remained significant after controlling for important covariates including participant gender, frequency of sex, knowledge of the partner's sexual history, and use of other forms of birth control.

A major methodological strength of this research concerns the daily nature of data collection. Previous research has examined the link between attachment orientations and condom use with cross-sectional, retrospective designs (Bogaert & Sadava, 2002; Feeney et al., 1999). This study is the first to extend this research using a daily experience methodology in which participants reported on their sexual interactions shortly after they occurred. The research design of this study allowed for the simultaneous examination of dispositional variables (i.e., attachment orientations) and situational variables (i.e., daily variations in relationship satisfaction)—an uncommon practice in research on condom use (Wiederman, 2004). Such a method provides a fuller and more nuanced understanding of the dynamics of condom use in the lives of dating couples.

Implications, Limitations, and Future Directions

The results of this study have important implications for understanding sexual risk-taking behaviors in intimate relationships. More specifically, this study suggests that interventions which take into account the symbolic meaning of condom use in intimate relationships may be more efficacious to the extent that they incorporate specific relationship factors. For example, taking note of people's attachment orientations and the daily context of their romantic relationships may help to identify difficult situations that require intervention such as when an individual is high in attachment anxiety, and the day is high in satisfaction, or if the individual is low in attachment avoidance (or high in anxiety) in combination with a day that was particularly satisfying for the relationship.

Several limitations of this research and directions for future research deserve comment. First, it will be valuable to extend the attachment framework used in this research to a broader range of couples. As the participants in this study were college students in dating relationships, it will be important to replicate and extend these findings to participants who have been involved in their relationships for shorter (e.g., adolescent relationships) or greater lengths of time (e.g., married couples). Although, on average, the participants in this study were involved in relatively long-term dating relationships (i.e., 1(1/2) years), our sample did not include any married couples. Future research should also explore the daily factors associated with birth control use in marital relationships because marriage is associated with less frequent use of condoms (Sheeran et al., 1999). Given the high rates of STIs and unwanted pregnancies among adolescents, future research should

also start earlier in the lifespan to examine how attachment orientations shaped prior to the onset of adolescence influence later condom use when girls and boys become sexually active. In addition, this study included only one member of the romantic couple. Recent research has begun to explore the role of both partners' attachment orientations in shaping sexual behavior in intimate relationships (e.g., Impett, Gordon, & Strachman, 2008; Brassard, Shaver, & Lussier, 2007). Future research would benefit from a dyadic perspective on attachment and condom use, measuring the attachment orientations and protection behaviors of both members of the couple. Because sexual interactions in romantic relationships involve two people, it is likely that both people's attachment orientations and daily feelings of relationship satisfaction shape sexual interactions and condom use more specifically.

Second, the measure of condom use included in this daily experience study was necessarily brief. There are many avenues of future research that would benefit from the use of daily experience methods and that could expand on the measures in this study. For example, this study did not differentiate between instances in which a person initiated the use of condoms versus times when a person agreed to use a condom upon a partner's suggestion. Daily diary methods in which partners report on their condom use behavior each day for multiple days would allow researchers to capture important differences between these two types of experiences. On a related note, we should also point out the difficulty in using this daily methodology for infrequent events, such as sexual behavior and condom use. In our 14-day daily diary study, participants engaged in sexual activity an average of three to four times. A longer diary assessment would have yielded more instances of sexual activity and may have yielded a greater amount of variability in condom use. Despite the drawback of having only a 2-week diary assessment, even for those participants who reported always or never using condoms, a daily measure provided a more nuanced and reliable indication of condom use behavior than is typically obtained in cross-sectional research. We suggest this methodological advantage outweighs the low frequency of sexual interactions and the small amount of variability in condom use behavior. It should also be noted that, although this diary study provides a more complete picture of condom use in dating relationships, the findings are correlational; and causal conclusions about links among attachment, relationship satisfaction, and condom use behavior cannot be determined using these data.

Third, future research could also explore people's reasons or motives for both using and not using condoms, as well as how these reasons may vary on a daily basis. Recent research has shown that attachment orientations are associated with motives for engaging in sexual intercourse (e.g., Impett, Gordon, & Strachman, 2008; Davis et al., 2004; Schachner & Shaver, 2004).

Similarly, it is also likely that people's attachment orientations shape their motives for using (and not using) condoms in their intimate relationships. For example, Cooper et al. (1998) found that for individuals in a current dating relationship, having sex to increase intimacy with the partner was associated with the continuation of condom use over time, whereas engaging in sex for physical enhancement was associated with the discontinuation of condom use. Moreover, motives for condom use may change from day to day, such that individuals may engage in sex more for sexual enhancement or intimacy reasons on some days than on others (Impett, Peplau, & Gable, 2005).

Fourth, future research could explore possible mechanisms of the association between relationship satisfaction and a decreased likelihood of using condoms on a daily basis. Previous studies have found that relationship satisfaction fluctuates from day to day and is associated with the occurrence of positive and negative daily relationship events (Gable, Reis, & Downey, 2003). Thus, the amount of support and conflict that couples experience may influence their daily feelings of relationship satisfaction, resulting in a greater or lesser likelihood of using condoms on particular days. Stressors outside of the relationship may also play a role. A recent study showed that higher levels of daily external stress influence sexual activity within the relationship (Bodenmann, Ledermann, & Bradbury, 2007). Finally, sexual goals may also be an important mechanism. Previous research has shown that people's motives for engaging in sexual activity also fluctuate from day to day (Impett, Peplau, & Gable, 2005), suggesting that there may be particular reasons why people engage in sex that either promote or inhibit condom use.

Conclusion

Despite the limitations, this study makes a number of unique contributions to our understanding of the links between attachment orientations and the sexual systems by measuring condom use during ongoing, sexual interactions. Future research should continue to pay close attention to the role that attachment orientations play in shaping aspects of sexual health in the lives of young adult couples.

References

- Birnbaum, G. E., Reis, H. T., Mikulincer, M., & Gillath, O. (2006). When sex is more than just sex: Attachment orientations, sexual experience, and relationship quality. *Journal of Personality & Social Psychology, 91*, 929–943.
- Bodenmann, G., Ledermann, T., & Bradbury, T. N. (2007). Stress, sex, and satisfaction in marriage. *Personal Relationships, 14*, 551–569.
- Bogaert, A. F. & Sadava, S. (2002). Adult attachment and sexual behavior. *Personal Relationships, 9*, 191–204.

- Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation: Anxiety and anger*. New York: Basic Books.
- Bowlby, J. (1980). *Attachment and loss: Vol. 3. Sadness and depression*. New York: Basic Books.
- Bowlby, J. (1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York: Basic Books. (Original work published 1969).
- Brassard, A., Shaver, P. R., & Lussier, Y. (2007). Attachment, sexual experience, and sexual pressure in romantic relationships: A dyadic approach. *Personal Relationships, 14*, 475–493.
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford.
- Brennan, K. A. & Shaver, P. R. (1995). Dimensions of adult attachment, affect regulation, and romantic relationship functioning. *Personality and Social Psychology Bulletin, 21*, 267–283.
- Campbell, L., Simpson, J. A., Boldry, J. G., & Kashy, D. (2005). Perceptions of conflict and support in romantic relationships: The role of attachment anxiety. *Journal of Personality & Social Psychology, 88*, 510–531.
- Cecil, H., Pinkerton, S. D., Bogart, L. M., Pavlovic, J., & Kimball, A. M. (2005). Empirical study of ordinal condom use measures. *Journal of Sex Research, 42*, 353–358.
- Centers for Disease Control. (2006). Youth risk behavior surveillance—United States, 2005. *Morbidity and Mortality Weekly Report, 55*(SS-5), 1–108.
- Civic, D. (2000). College students' reasons for nonuse of condoms within dating relationships. *Journal of Sex & Marital Therapy, 26*, 95–105.
- Collins, N. L. & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality & Social Psychology, 58*, 644–663.
- Cooper, M. L., Shapiro, C. M., & Powers, A. M. (1998). Motivations for sex and risky sexual behavior among adolescents and young adults: A functional perspective. *Journal of Personality & Social Psychology, 75*, 1528–1558.
- Croyle, R. T. & Loftus, E. F. (1993). Recollections in the kingdom of AIDS. In D. G. Ostrow & R. C. Kessler (Eds.), *Methodological issues in AIDS behavioral research* (pp. 163–180). New York: Plenum.
- Davis, D., Shaver, P. R., & Vernon, M. L. (2004). Attachment style and subjective motivations for sex. *Personality and Social Psychology Bulletin, 30*, 1076–1090.
- Department of Health and Human Services. (2000). *Healthy People 2010* (2nd ed.). Washington, DC: U.S. Government Printing Office.
- Feeney, J. A. (1994). Attachment style, communication patterns and satisfaction across the life cycle of marriage. *Personal Relationships, 1*, 333–348.
- Feeney, J. A., Kelly, L., Gallois, C., Peterson, C., & Terry, D. J. (1999). Attachment style, assertive communication, and safer-sex behavior. *Journal of Applied Social Psychology, 29*, 1964–1983.
- Feeney, J. A. & Noller, P. (2004). Attachment and sexuality in close relationships. In J. Harvey, A. Wenzel, & S. Sprecher (Eds.), *Handbook of sexuality in close relationships* (pp. 183–202). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Feeney, J. A., Peterson, C., Gallois, C., & Terry, D. J. (2000). Attachment style as a predictor of sexual attitudes and behavior in late adolescence. *Psychology and Health, 14*, 1105–1122.
- Fincham, F. D. & Bradbury, T. N. (1987). The impact of attributions in marriage: A longitudinal analysis. *Journal of Personality & Social Psychology, 53*, 510–517.
- Fortenberry, J. D., Tu, W., Harezlak, J., Katz, B. P., & Orr, D. P. (2002). Condom use as a function of time in new and established adolescent sexual relationships. *American Journal of Public Health, 92*, 211–213.
- Fraley, R. C. & Waller, N. G. (1998). Adult attachment patterns: A test of the typological model. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 77–114). New York: Guilford.
- Gable, S. L. & Haidt, J. (2005). What (and why) is positive psychology? *Review of General Psychology, 9*, 103–110.
- Gable, S. L., Reis, H. T., & Downey, G. (2003). He said, she said: A quasi-signal detection analysis of daily interaction between close relationship partners. *Psychological Science, 14*, 100–105.
- Gentzler, A. L. & Kerns, K. A. (2004). Associations between insecure attachment and sexual experiences. *Personal Relationships, 11*, 249–265.
- Graham, C. A., Catania, J. A., Brand, R., Duong, T., & Canchola, J. (2003). Recalling sexual behavior: A methodological analysis of memory recall bias via interview using the diary as the gold standard. *Journal of Sex Research, 40*, 325–332.
- Hammer, J., Fisher, J. D., Fitzgerald, P., & Fisher, W. A. (1996). When two heads aren't better than one: AIDS risk behavior in college couples. *Journal of Applied Social Psychology, 26*, 375–397.
- Hazan, C. & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality & Social Psychology, 52*, 511–524.
- Hazan, C. & Zeifman, D. (1994). Sex and the psychological tether. In K. Bartholomew & D. Perlman (Eds.), *Advances in personal relationships: Vol. 5. Attachment processes in adulthood* (pp. 151–178). London: Jessica Kingsley Publishers, Ltd.
- Hill, C. A. & Preston, L. K. (1996). Individual differences in the experience of sexual motivation: Theory and measurement of dispositional sexual motives. *Journal of Sex Research, 33*, 27–45.
- Impett, E. A. & Peplau, L. A. (2002). Why some women consent to unwanted sex with a dating partner: Insights from attachment theory. *Psychology of Women Quarterly, 26*, 359–369.
- Impett, E. A., Peplau, L. A., & Gable, S. L. (2005). Approach and avoidance sexual motivation: Implications for personal and interpersonal well-being. *Personal Relationships, 12*, 465–482.
- Impett, E. A., Gordon, A., & Strachman, A. (2008). Attachment and daily sexual goals: A study of dating couples. *Personal Relationships, 15*, 375–390.
- Katz, B. P., Fortenberry, J. D., Zimet, G. D., Blythe, M. J., & Orr, D. P. (2000). Partner-specific relationship characteristics and condom use among young people with sexually transmitted diseases. *Journal of Sex Research, 37*, 69–75.
- Kirkpatrick, L. A. & Davis, K. E. (1994). Attachment style, gender, and relationship stability: A longitudinal analysis. *Journal of Personality & Social Psychology, 66*, 502–512.
- Kline, A., Kline, E., & Oken, E. (1992). Minority women and sexual choice in the age of AIDS. *Social Science and Medicine, 34*, 447–457.
- Mikulincer, M. & Shaver, P. R. (2007). *Attachment in adulthood—Structure, dynamics, and change*. New York: Guilford.
- Misovich, S. J., Fisher, J. D., & Fisher, W. A. (1997). Close relationships and elevated HIV risk behavior. Evidence and possible underlying psychological processes. *Review of General Psychology, 1*, 72–107.
- Noar, S. M., Zimmerman, R. S., & Atwood, K. A. (2004). Safer sex and sexually transmitted infections from a relationship perspective. In J. Harvey, A. Wenzel, & S. Sprecher (Eds.), *Handbook of sexuality in close relationships* (pp. 519–544). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., & Congdon, R. T. (2000). *HLM5: Hierarchical linear and nonlinear modeling*. Chicago: Scientific Software International.
- Reis, H. T. & Gable, S. L. (2000). Event-sampling and other methods for studying daily experience. In H. T. Reis & C. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 190–222). New York: Cambridge University Press.
- Saul, J., Norris, F. H., Bartholow, K. K., Dixon, D., Peters, M., & Moore, J. (2000). Heterosexual risk for HIV among Puerto Rican

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- women: Does power influence self-protective behavior? *AIDS and Behavior*, 4, 361–371.
- Schachner, D. A. & Shaver, P. R. (2004). Attachment dimensions and sexual motives. *Personal Relationships*, 11, 179–195.
- Shaver, P. R., Hazan, C., & Bradshaw, D. (1988). Love as attachment: The integration of three behavioral systems. In R. J. Sternberg & M. Barnes (Eds.), *The psychology of love* (pp. 68–99). New Haven, CT: Yale University Press.
- Shaver, P. R. & Mikulincer, M. (2006a). Attachment theory, individual psychodynamics, and relationship functioning. In D. Perlman & A. Vangelisti (Eds.), *The Cambridge handbook of personal relationships* (pp. 251–271). New York: Cambridge University Press.
- Shaver, P. R. & Mikulincer, M. (2006b). A behavioral systems approach to romantic love relationships: Attachment, caregiving, and sex. In R. J. Sternberg & K. Weis (Eds.), *The new psychology of love* (pp. 35–64). New Haven, CT: Yale University Press.
- Sheeran, P., Abraham, C., & Orbell, S. (1999). Psychosocial correlates of heterosexual condom use: A meta-analysis. *Psychological Bulletin*, 125, 90–132.
- Simpson, J. A. (1990). Influence of attachment styles on romantic relationships. *Journal of Personality & Social Psychology*, 59, 971–980.
- Snijders, T. & Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London: Sage.
- Weinstock, H., Berman, S., & Cates, W. (2004). Sexually transmitted diseases among American youth: Incidence and prevalence estimates, 2000. *Perspectives on Sexual and Reproductive Health*, 36, 6–10.
- Wiederman, M. W. (2004). Methodological issues in studying sexuality in close relationships. In J. H. Harvey, A. Wenzel, & S. Sprecher (Eds.), *Handbook of sexuality in close relationships* (pp. 31–56). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.