
Adult attachment and sexual behavior

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Abstract

The relations between adult attachment processes and sexuality were examined in a community sample of 792 young adults (327 men and 465 women) from the Niagara region of Canada. Participants completed questionnaires that included Simpson's (1990) measure of adult attachment, self-reported physical attractiveness, erotophilia, and a variety of sexual behavior measures (e.g., number of sexual partners, age of first sexual experience, frequency of sexual behaviors in the past year, whether an affair had occurred in the past year, and consistent condom usage). The sexuality measures were factor analyzed to extract common factors. The results were modest, but a number of significant relationships between sexuality and attachment were observed. For example, people scoring higher on a secure attachment index perceived themselves as more physically attractive, whereas people scoring higher on an anxious attachment index perceived themselves as less physically attractive, had an early first intercourse (and more lifetime partners), more infidelity, and took more sexual precautions (e.g., condom usage). The results were generally stronger in women, with most of the attachment/sexuality associations in the full sample being driven by the results in women. Implications for understanding sexual variability, including high-risk sexual behavior, are discussed.

Bowlby (1969; 1973) has posited that humans have an innate bonding/attachment system that keeps parents/caregivers in close proximity to their (vulnerable) infants. He believed that infants have certain behavioral and emotional reactions associated with separation (e.g., crying, protest) that are integral parts of this system. Although the system is proposed to be innate and universal, it is also reported to be sensitive to certain environmental circumstances—in particular, to the types of care provided by the primary caregivers. Using the Strange Situation Paradigm, Ainsworth, Blehar, Waters, and Wall (1978) researched and identified different patterns or styles of attachment that emerge in infants

under these different types of parental care. Ainsworth et al. reported that mothers who provide infants with consistent care and emotional support tend to have children with a *secure* attachment style. These children have high levels of affiliative and exploratory behavior and consistently use their mothers as a secure base to regulate distress and anxiety. In contrast, mothers who vary in their care, sometimes being overprotective and sometimes being inattentive, tend to have children with an *anxious/ambivalent* style. These children tend to be less exploratory and make inconsistent and conflicted attempts to secure support from caregivers. Finally, mothers who are not responsive to an infant's needs produce children with an *avoidant* attachment style. These children typically do not seek support from their caregivers and indeed actively avoid their mothers when distressed. These early parental care experiences give rise to working *mental models* of the self and others, which form a basis for generating expectations about relationships and provide a context for interpreting what

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happens in those relationships (Bowlby, 1973). Thus, these early attachment experiences have a profound effect on people's relationships throughout their lives. Researchers have suggested that adult relationships may reflect similar attachment orientations to those originally observed in children (e.g., Hazan & Shaver, 1987; Levy & Davis, 1988; Simpson & Rholes, 1998). Individuals with a secure attachment style are confident and trusting in intimacy, develop closeness with others easily, tend to feel stable and committed in their relationships, and rarely worry about being abandoned. Avoidant individuals are characterized as uncomfortable with intimacy and as emotionally distant and aloof; they have difficulty trusting and depending on others, and report being uncomfortable when anyone gets too close. Anxious-ambivalent individuals are characterized as having relationships fraught with dependency and conflict; they report that others are reluctant to get close/intimate with them, they view others as undependable and untrustworthy, and they worry that their partner does not love and/or will abandon them.

Adult attachment processes have been related to numerous relationship-oriented behaviors, including beliefs and attitudes toward romantic love (Hazan & Shaver, 1987), partner pairing and relationship stability over time (Kirkpatrick & Davis, 1994), relationship satisfaction and commitment (Collins & Read, 1990; Feeney & Noller, 1990; Simpson, 1990), jealousy (Sharpsteen & Kirkpatrick, 1997), relationship trust (Mikulincer, 1998), support seeking and giving within couples (Simpson, Rholes, & Nelligan, 1992), couple violence (Roberts & Noller, 1998), nonverbal behavior in dating couples (Tucker & Anders, 1998), relationship-threatening situations (Simpson, Ickes, & Grich, 1999), patterns of disclosure (Mikulincer & Nachshon, 1991), and reactions to a couple's infertility (Mikulincer, Horesh, Levy-Shiff, Manovich, & Shalev, 1998). In general, those with a secure attachment orientation have more successful, intimate relationships.

One central aspect to romantic relationships that has not been extensively studied within

the context of adult attachment is sexual behavior (for a review, see Kirkpatrick, 1998). Sexual behavior is a defining feature of most romantic/love relationships, and, thus, one might expect that adult attachment should be relevant to this behavior. Indeed, attachment theorists often argue that romantic love involves the integration of sexuality, caregiving, and attachment processes (e.g., Shaver, Hazan, & Bradshaw, 1988; cf. Feeney & Raphael, 1992), and most modern theories of adult love include a sexual/passionate component (e.g., Sternberg, 1986). Moreover, it has been argued (e.g., Lovejoy, 1981) that the bond partners form in romantic/love relationships is partly energized by sexual attraction/behavior and ultimately comes from and serves sexual/reproductive ends.

Some evolutionary theorists (e.g., Belsky, Steinberg, & Draper, 1991; Draper & Harpending, 1982; Kirkpatrick, 1998) have also linked sexuality and attachment. They have argued that attachment processes play a role in the development of our reproductive/sexual strategies and, ultimately, our evolutionary history. Relative to most animals, human offspring typically have a prolonged and intense period of care by and attachment to their parents. Stable pair-bonding (a long-term reproductive strategy) among prospective human parents facilitates such care in children. However, as these researchers have also noted, individual differences in attachment processes and resulting reproductive strategies occur in humans. In particular, a weak attachment to parents (e.g., absence of a parent) can profoundly affect the cues and decision rules about which reproductive strategy is most likely to be acted out in adult environments. If, for example, children form relatively insecure attachments to parents (e.g., because they lack a stable home), their adult environments are likely to be unstable and not conducive to a long-term mating life history and they may adopt an unrestricted or short-term mating strategy (e.g., early onset of sex, many short-term partners). Thus, individual differences in sexual/reproductive behavior, in particular variables related to promiscuity and short-term versus long-term mating (e.g., age of first sexual experience; number of partners), and

attachment processes may be functionally linked.

Sexual behaviors relevant to attachment processes

Sexuality researchers have noted substantial variability in human sexual behavior. Some people have many sexual partners; others may have only one or perhaps no sexual partner in their entire lifetimes. Similarly, some people participate frequently in a variety of sexual behaviors (masturbation, oral sex, vaginal sex, anal sex), whereas others may participate in only one type of sexual activity (e.g., vaginal sex) and perhaps only on an infrequent basis. Interestingly, Simpson and Gangestad (1991) demonstrated that human sexual behavior is multifactorial—that is, certain sexual behaviors cohere but are relatively independent of other sexual behaviors. For example, sex drive variables (e.g., frequency of sex, such as masturbation or interpersonal sexual activity) are relatively independent of variables related to promiscuity or what they term an “unrestricted sociosexual orientation” (e.g., early sexuality; many partners).

As noted, attachment may be linked to, and thus particularly relevant for understanding, these promiscuity/unrestricted-sociosexual-orientation variables. Indeed, research has shown that these variables (e.g., short-term vs. long-term relationships, casual sex) are associated with attachment. Hazan and Shaver (1987) reported that secure adults are more likely than insecure adults to have longer relationships and are less likely to have been divorced. In addition, Brennan and Shaver (1995) and Miller and Fishkin (1997) found that insecure adults (those higher in avoidance) are more interested in and have more casual (short-term) sexual experience. Given that people higher in avoidance tend to be emotionally distant and aloof, tend to lack trust in others, and are disinclined to form long-term relationships (Hazan & Shaver, 1987), it is not surprising that these people may have a large number of (short-term) partners. It is also interesting to note that Stephen and Bachman (1999), using a new model of attachment, provided preliminary

evidence that insecure undergraduates have an elevated interest in casual sex. Finally, research indicates that, relative to those with stronger parental bonds, those who form weak bonds with their parents tend to engage in a variety of *externalizing behaviors* (e.g., Grych & Finchman, 1990; Loeber & Dishon, 1983), one of which is promiscuity (Robins, 1966).

However, there are data that qualify this research on attachment processes and number of partners. Kirkpatrick and Davis (1994) found that anxious women paired with avoidant men had relatively stable relationships, even as stable as those of secure-secure pairings. Thus, stable relationships may occur in insecure individuals if they pair with a partner who fills a niche.

A variable related to partner number and casual sex is extraregionality sexuality (affairs). One might expect that attachment insecurity should predict affairs because insecure individuals may be more interested in short-term sexual relations generally and because they have more conflict in their relationships. For example, there is evidence that people who have affairs report elevated relationship dissatisfaction (Hatfield, 1978). Moreover, because anxious-ambivalence has been linked to unstable relationships, and hypervigilance to possible sources of relationship distress (e.g., Mikulincer, Florian, & Weller, 1993; Simpson et al., 1999), this attachment dimension may relate to reports that one's partner(s) is/are having affairs. In an unpublished study, Hazan, Zeifman, and Middleton (1994, as cited in Kirkpatrick, 1998) reported that adults higher in avoidance were more likely than adults higher in secure attachment to have sex outside of their established relationships. Gangestad and Thornhill (1997) partly contradicted these findings, however, showing that, in women, anxious-ambivalence positively covaries with number of affairs, whereas avoidance negatively covaries with number of affairs.

Also of interest is age of first sexual experience. Like a high number of partners, an early first intercourse is often considered part of a constellation of externalizing behaviors that includes, among other behaviors, delinquency (e.g., Jessor & Jessor, 1977). It is

also, as mentioned, considered by some evolutionary theorists to be part of an unrestricted or short-term mating strategy (e.g., Belsky et al., 1991). We know of no research relating early sexuality to adult attachment, but some studies have shown that, relative to those with stronger parental bonds, those who form weak bonds with their parents tend to have early sexual experience (e.g., Draper & Harpending, 1982). Thus, people higher in avoidance and anxious-ambivalence may have an early first intercourse relative to people higher in attachment security. Even so, it is important to note that there is qualifying evidence (e.g., Rosenthal, Burklow, Lewis, Succop, & Biro, 1997) suggesting that early teenage involvement in sex is predicted by a *serious* dating relationship, which presumably involves more secure adolescents.

Also of interest are frequency of partnered and nonpartnered sexual behavior. As mentioned, these variables are independent of promiscuity variables (e.g., Simpson & Gangestad, 1991) and thus may seem less directly related to attachment. However, there are still reasons to explore such variables. One might predict, for example, that attachment security is associated with frequent partnered sexuality, in part because attachment security is linked to stable, close, and mutually satisfying relationships (Hazan & Shaver, 1987). Indeed, there is evidence that low sexuality is associated with relationship dissatisfaction (Donnelly, 1993). One might also expect that attachment insecurity should relate to masturbation frequency, in part because attachment security is associated with satisfying romantic (and sexual) relationships. This may be particularly so for avoidance, which may reflect low interest in intimate partner contact, and thus a preference for autosexuality. However, there is evidence that those who masturbate are more likely to have sex with a partner (Laumann, Gagnon, Michael, & Michaels, 1994). Thus, it is unclear if an attachment/masturbation relationship should occur.

We also explored a well-researched dimension in sexology, erotophilia/erotophobia or positive/negative affect about sexuality (Fisher, Byrne, White, & Kelley, 1988). Erotophiles respond positively to sexuality, whereas eroto-

phobes are more prudish and influenced by sexual guilt and fear. Fisher et al. speculated that erotophobia arises from restrictive and punitive parenting, especially revolving around issues related to the body and physical relationships. One might expect, then, that attachment security and erotophilia are related, given that secure attachment is associated with comfortable romantic/personal relationships generally, including presumably the physical/sexual components of such relationships. However, erotophilia has been linked to multiple sexual partners and casual sex, and thus may reflect, in part, a short-term mating strategy (e.g., Bogaert & Rushton, 1989), as having frequent sexual activity with multiple partners requires a certain comfort with sexual matters generally.

Finally, we examined possible relationships between attachment, sexual problems, and high-risk sexuality (e.g., condom use, STDs). We know of no attachment research on sexual problems/dysfunctions, but because attachment insecurity/avoidance is associated with relationship conflict, this dimension may be linked to more sexual problems (e.g., dysfunctions). For example, one factor argued to be associated with sexual dysfunctions is relationship conflict (e.g., Kaplan, 1979). Attachment insecurity/avoidance may also relate to STDs, in part because insecurity may be associated with more partners, which is a higher risk practice (e.g., Anderson & May, 1992). In addition, attachment insecurity/avoidance may relate to low condom use, in part because this dimension is associated with poor partner communication, itself an impediment to safer sexual practices such as condom use (e.g., Moore & Parker-Halford, 1999). However, a case could also be made that, because insecure attachment/avoidance is associated with relationship distrust (Mikulincer, 1998), condom use and/or engaging in less intimate sexual practices may increase and thus reduce STDs and other health issues such as unwanted pregnancy.

Moderators

This study also attempted to establish the importance of moderators of the attachment/sexuality relationship. One possible moderator

is sex/gender. In particular, attachment and its various links to sexuality may depend on men's strategy/role of being initiators and women's strategy/role of being "gatekeepers." For example, men generally desire sex earlier in relationships than women do (e.g., Carroll, Volk, & Hyde, 1985). One might then expect anxious-ambivalence in women to relate to early first intercourse and more partners because women higher on such a dimension may succumb to men's pressures to have sex in order to avoid feeling abandoned/rejected. Men, in contrast, are less fluid in their sexual activity (Baumeister, 2000), and thus should be less responsive to attachment processes in this context. Some research supports this prediction, where in women (but not in men) anxious-ambivalence has been related to affairs (Gangestad & Thornhill, 1997).

Another possible moderator is self-reported physical attractiveness. Self-reported physical attractiveness may either facilitate or restrain sexuality depending on one's attachment. For example, high self-reported attractiveness may combine with attachment insecurity to increase the number of (short-term) liaisons. This is in part because high attractiveness relates to high sexual activity, including number of partners (e.g., Bogaert & Fisher, 1995). In addition, people's perception of their own physical attractiveness may combine with attachment security to predict frequent activity (e.g., coitus) because high attractiveness and high security may engender relationship/sexual confidence and sex appeal.

In summary, surprisingly little research has been conducted on attachment and sexuality, and even less has investigated possible moderators of these relationships. In this study, the relation between adult attachment and sexuality was investigated, along with possible moderators of this relationship (sex/gender, physical attractiveness) in a community sample of young adults.

Method

Participants

The sample in the present study comprised the second wave (1995/1996) of the Niagara

Young Adult Health Study (NYAHS). Supported by the National Health and Research Development Program of Canada, NYAHS was implemented to study psychosocial determinants (e.g., stress, unemployment) of physical and mental health of young adults in the Niagara region of Canada. The second wave of the NYAHS contained a follow-up sample ($N = 574$), initially contacted 4 years earlier (original sample 843), along with a new sample of young adults ($N = 239$). A total of 813 participants returned questionnaires for the second wave of the NYAHS. Only the second wave of the sample received sexuality measures, so we are concentrating on this portion of the sample for the present study.

Participants were recruited via random-digit-dialing techniques. Each household contacted was asked if there was anyone within the ages of 20 to 29 who might be willing to participate in our study. (The follow-up sample, initially contacted 4 years earlier, would be, of course, about 4 years older than the new sample of young adults.) Following initial contact, questionnaires were mailed out, along with stamped, self-addressed envelopes, and potential participants were again contacted by telephone as a reminder to complete the questionnaire and to ask if they had questions with any of the items.

The final sample for the study was 792 participants after 21 volunteers were eliminated because their ages were clearly outside the entrance criteria for the study (final male $n = 327$; final female $n = 465$). The mean age of the participants was 28.0 years, and ranged from 19 to 35 years.¹ Participants were paid a nominal fee for their participation.

Most of the participants comprising the sample were married, engaged, or in a committed relationship (72%), whereas 27% were unattached. The mean personal income of the participants was between \$10,000 and \$20,000 per year (approximately \$7,000–15,000 in U.S. funds). This level of income

1. Re-recruitment of the second wave was time consuming, and some questionnaires were returned many months after initial recontact, so we retained participants who were 35 years or younger, because these participants may have been 29 when at initial contact.

was, as expected, lower than the Niagara average of \$24,000–25,000 (CDN; Statistics Canada, 1996), given the young age of the sample. It is of note that the average household income was higher, \$30,000–40,000 (approximately \$19,500–26,000 in U.S. funds).

An open-ended question asked about the participants' ethnic/cultural/racial group: "Which ethnic/cultural/racial group do you belong to?" European countries or Canada (i.e., "Canadian") was listed by 61.8% of the participants; 8.2% indicated no or "none"; Asian countries were listed by 1% of the participants; and 29.4% reported some other group not specified above.

Measures

All participants completed an extensive health questionnaire. The following measures were included in the present study.

Demographics. Sex/gender, age, ethnicity, and personal and total family income (ranging from 1 = *less than \$5,000* to 11 = *\$100,000 or more*) were included. Relationship status (i.e., whether the participant was currently in a serious relationship) was included (1 = *yes*; 0 = *no*). The questionnaire did not include information on relationship duration.

Attachment. Based on Hazan and Shaver's (1987) a priori descriptions of the traditional three attachment styles (secure, avoidant, anxious-ambivalent), Simpson (1990; see also Simpson et al., 1992) decomposed the descriptions into 13 statements. Participants in the present study responded to these statements on 4-point scales (from 1 = *strongly agree* to 4 = *strongly disagree*). Factor analyses have shown that this scale contains two relatively interpretable attachment dimensions (Hendrick & Hendrick, 1989; Simpson, 1990; Simpson et al., 1992). Thus, based on the items loading most highly on these two factors (see Simpson et al., 1992), we formed two attachment dimensions, an *avoidant/secure attachment index* and an *anxious attachment index*. In the present study, scores were coded so that

higher scores indicated greater security and anxiousness, respectively. The reliabilities (standardized alpha coefficients) for the secure index were .74 for men and .71 for women; for the anxious index, they were .65 for men and .63 for women (for comparable reliabilities, see Simpson et al., 1992). Note these indices map onto Bartholomew and colleagues' four-category prototypical conceptualization of attachment (e.g., Bartholomew & Horowitz, 1991; Bartholomew & Shaver, 1998). The avoidant-secure dimension captures categories of secure and dismissive (avoidant), and the anxious attachment dimension would include both the preoccupied and fearful categories. Indeed, these dimensions correspond to the self-model and other-model dimensions as derived by Griffin and Bartholomew (1994). Note, however, that we have elected to utilize a dimensional approach in which individuals vary on both the avoidant-secure and anxious attachment orientations, rather than the mutually exclusive prototype categories.

Sexuality. Measures included age at first intercourse and age at first masturbation. Also included were number of partners in lifetime and in the past year (which could range from 0 = *none* to 9 = *100 or more*) and typical monthly frequency of sexual activity with a partner and typical monthly masturbation frequency in the past year (which could range from 0 = *none* to 9 = *31 or more times per month*). Condom usage for those with one or more partners in the past year was included as well (with a range of 1 = *always* to 7 = *never*). The participants were asked whether they had ever been diagnosed with one or more of various STDs (e.g., gonorrhea, chlamydia, herpes, HIV/AIDS). The number of STDs checked off were summed to form an STD total score.

Participants were also asked whether (in the past year) they had had an affair, found out that their partner had had an affair, and if they had had "sexual problems." These three items were part of the Life Events Scale, a multi-item battery that asks respondents to indicate (1 = *yes* or 0 = *no*) whether events in several areas of day-to-day living, including sexuality,

had occurred in the past year (Hammen, Marks, De Mayo, & De Mayo, 1985). On this scale, definitions of *affair* and *sexual problems* are left up to the respondents themselves.

The typical sexual activity (or activities) engaged in with their partner (or partners) in the past year was also asked of the participants. For this measure, the participants checked off *any* activity they typically engaged in with a partner or partners (i.e., hand touching of genitals, oral sex, vaginal intercourse, anal intercourse). Thus, a higher score on this variable indicated a higher variety of sexual activities.

To assess erotophilia or positive sexual affect, the 21-item Sexual Opinion Survey (Fisher et al., 1988) was used. Example items are "I think it would be entertaining to look at erotica" and "Swimming in the nude with a member of the opposite sex would be an exciting experience." Erotophilia scores can range from 22 (most erotophobic) to 137 (most erotophilic). These items are responded to using 7-point Likert-type scales. Those who score higher on this scale, relative to those who score lower, have been found to report less sex guilt, have more experience with masturbation, and have a greater variety of sexual experiences (Fisher et al., 1988). In the present study, the standardized alpha coefficient was .79, similar to published reliability coefficients for this scale (Fisher et al., 1988).

To assess attractiveness, three 7-point self-report items (1 = *well below average* to 7 = *well above average*) were aggregated: how physically attractive respondents thought they were, how sexually appealing they thought they were, and how a stranger would rate them on attractiveness. These three items correlated with one another at .78 or higher.

Results

Table 1 presents the means, standard deviations, and internal consistency reliabilities for the measures used in this study. We also assessed whether there were sex/gender differences on these variables. Men and women did not differ on the two attachment indices, but,

as in other studies (e.g., Oliver & Hyde, 1993), they did differ on some sexuality variables, with men, for example, having a higher frequency of masturbation, $t(452.72) = 9.53$, $p < .001$, and more erotophilia, $t(732.25) = 9.05$, $p < .001$.

The two attachment measures were significantly but moderately correlated with one another, with the secure index correlating $-.21$ ($p < .001$) with the anxious index.

To reduce the number of sexuality measures, the sexuality measures, excluding physical attractiveness and erotophilia, were subjected to a principal components analysis with varimax rotation (see Table 2). We derived five components, all with eigenvalues greater than 1, a fairly standard practice with principal components/factor analysis (see Kaiser, 1970). In addition, inspection of the scree plot did not indicate a large discontinuity between any of the factors, although there were small discontinuities between the 1st and 2nd and 3rd and 4th components. Finally, all five components were interpretable and seemed to reflect meaningful ways of dividing the sexuality variance. The five components were labeled as follows: I, early first intercourse/more partners; II, masturbation activity; III, infidelity; IV, sexual intercourse/variety and; V, (recent) condom use. These five components accounted for 62.7% of the sexuality variance. Note that, consistent with Simpson and Gangestad (1991), promiscuity variables (Factor I) were relatively independent of sex drive/frequency (e.g., Factors II and IV) variables. The participants' factors scores (using the regression method) on these five components served as sexuality variables.²

Table 3 presents correlations between scores on the two attachment indices and the demographics, attractiveness, erotophilia, and the five components of sexuality mentioned above. As shown, when men and women were

2. For the factor analyses (and resulting sexuality variables factor scores), we used only used those individuals who were sexually active in the past year. So participants scoring zero for certain sexuality variables (e.g., an affair in the past year), simply because they have not been sexually active, should be not an issue in these data.

Table 1. Means, standard deviations, and internal consistency reliabilities for the measures

Measures	<i>M</i>	<i>SD</i>	<i>Standardized alpha</i>
Age in years	27.97	4.70	—
Relationship status	1.27	0.44	—
Total family income	5.45	2.76	—
Attractiveness	13.09	3.37	—
Erotophilia	83.97	22.16	0.79
Year of first coitus	17.41	2.65	—
Year of first masturbation	15.08	2.91	—
Lifetime partners	3.89	1.67	—
Partners in past year	2.18	0.70	—
Sex frequency in past year	3.58	1.76	—
Variety of partner sex activities	2.59	1.10	—
Masturbation in past year	2.31	1.75	—
Sex difficulties in past year	0.16	0.37	—
Partner unfaithful in past year	0.04	0.19	—
Had affair in past year	0.05	0.21	—
No. of STDs	0.14	0.42	—
Condom use	3.12	2.38	—
Secure attachment	16.35	3.59	0.72
Anxious attachment	9.05	3.12	0.64

Note. Sample sizes differ for some variables because of missing cases; relationship status is 1 = *attached* and 2 = *nonattached*; total family income can range from 1 = *less than \$5 000* to 11 = *\$100 000 or more*; attractiveness can range from 3 = *well below average* to 21 = *well above average*; erotophilia scores ranges from 22 (most erotophobic) to 137 (most erotophilic); lifetime partners and partners in last year can range from 0 = *none* to 9 = *100 or more*, with 2 = *2 or 3 partners*, 3 = *4 or 5 partners*, and 4 = *6–9 partners*; masturbation and sex frequency can range from 0 = *none* to 9 = *31 or more times per month*, with 2 = *3–5 times per month*, 3 = *6–10 times per month*, and 4 = *11–15 times per month*; variety of partner sex activity can range from 0 = *no typical sexual activities* to 4 = *4 typical activities* (oral, hand manipulation, vaginal, anal sex); Condom use can range from 1 = *never* to 7 = *always*; sex difficulties, partner unfaithful, and had affair in last year are 0 = *no* and 1 = *yes*; and secure and anxious attachment scores are totals based on items that can range from 1 (*lowest score on item*) to 4 (*maximum score on item*).

combined (see the full sample columns in Table 3), secure attachment was positively correlated with attractiveness and total family income and negatively related to relationship status (i.e., more likely to have a current steady partner) and masturbation. Anxious attachment was negatively related to age, total family income, and attractiveness and positively related to relationship status (i.e., less likely to have a steady partner), erotophilia, and to Factors I (early first intercourse/more partners), III (infidelity), and V (recent condom use).

In men, secure attachment was negatively associated with relationship status (i.e., more likely to have a current steady partner) and positively linked to self-reported physical

attractiveness. Anxious attachment was positively associated with relationship status (i.e., less likely to have a steady partner) and negatively related to self-reported physical attractiveness. No other significant correlations occurred between the two attachment indices and sexuality in men.

In women, secure attachment was negatively associated with relationship status (i.e., more likely to have a steady partner), early first intercourse/more partners (Factor I), and condom use (Factor V), and positively related to total family income and attractiveness. Anxious attachment was negatively related to age and total family income, and positively associated with relationship status (i.e., less likely to have a steady partner), erotophilia,

Table 2. Principal components analysis with varimax rotation of sexual measures

Measures	Components/factors				
	I	II	III	IV	V
Age at first intercourse	-.803	.089	.071	-.066	.103
Age at first masturbation	-.084	-.820	.053	-.098	.033
No. of lifetime partners	.789	.247	.126	.083	.274
No. of past year partners	.378	.180	.489	.156	.501
Last year sex frequency	.116	.014	.151	.764	-.261
Last year masturbation. frequency	.070	.815	.165	-.039	.059
Last year sexual problems	-.008	.300	-.011	-.458	-.124
Last year partner had affair	.045	-.108	.753	.028	-.059
Last year had affair	.067	.176	.723	-.049	.096
Sexually transmitted diseases	.609	.068	.137	-.011	-.084
Low condom use	.089	.044	-.005	-.059	.891
Intercourse/sex variety	.009	.310	-.160	.695	.097
Eigenvalue	2.52	1.44	1.39	1.21	1.04

early first intercourse/more partners (I), infidelity (III), and condom use (V). Interestingly, when men and women are combined it seems clear that the associations between secure and anxious attachment and the various sexuality measures (e.g., early first intercourse/more partners, infidelity, and condom

use) are largely driven by these relationships in women because there were no significant relationships between the attachment indices and these measures in men, but there were, as mentioned, significant relationships between the attachment indices and these measures in women.

Table 3. Correlations between attachment and attractiveness, erotophilia, and sexuality

Measures	Secure attachment			Anxious attachment		
	Full sample	Men only	Women only	Full sample	Men only	Women only
Age	-.019	.031	-.056	-.111**	-.082	-.120**
Relationship status	-.122**	-.142**	-.096*	.134**	.169**	.109*
Total family income	.129**	.103	.138*	-.139**	-.071	-.195**
Attractiveness	.145**	.135*	.151**	-.114**	-.158**	-.074
Erotophilia	.001	.094	-.049	.074*	.021	.138**
Early first intercourse (Factor I)	-.064	.044	-.158*	.126**	.080	.170**
Masturbation (Factor II)	-.098*	-.085	-.067	.041	.126	.011
Infidelity (Factor III)	-.025	-.068	.015	.129**	.121	.138*
Intercourse/sex variety (Factor IV)	.051	.046	.060	-.032	.016	-.068
Recent condom use (Factor V)	-.101*	-.020	-.157*	.129**	.114	.149*

Note: Relationship status is 1 = attached, 2 = not attached.

* $p < .05$. ** $p < .01$.

Finally, linear regressions were undertaken for two reasons. First, we were interested in testing whether sex/gender and physical attractiveness moderated the relations between attachment and sexuality. As such, these regression analyses allowed us to investigate if there were any two-way interactions between attachment and attractiveness and attachment and sex/gender and any three-way interactions among attachment, attractiveness, and sex/gender to predict sexuality. One significant ($p < .05$) interaction occurred: A sex/gender \times secure attachment to predict early first intercourse/more partners (I), such that secure attachment predicted lower scores on this factor in women but not in men. Thus, this result partially confirms the previous findings suggesting that the sexuality/attachment results in the full sample are largely driven by these relationships in women.

Second, regression analyses were performed to investigate whether in the full sample and in the sample of women attachment scores still predicted early first intercourse/more partners (I), infidelity (III), and (recent condom use (V), controlling for age, physical attractiveness, income, and relationship status (i.e., whether in a serious relationship or not). These results demonstrated that secure attachment still predicted early first intercourse/more partners (I; negatively) in both the full sample and in the sample of women. In addition, anxious attachment still predicted (recent condom use (V) in the full sample. All other attachment/sexuality associations were no longer significant controlling for these additional variables.

Discussion

We investigated the relations between adult attachment and sexuality in a community sample of young adults. Some modest but significant relationships occurred. For example, we found that attachment security is related to greater self-reported physical attractiveness, whereas anxious attachment is associated with lower physical attractiveness, early first intercourse (and more lifetime partners), more infidelity, and higher condom usage. The results were stronger in women, with most of

the attachment/sexuality associations in the full sample being driven by the results in women. Overall, the findings seem to confirm the expectation that in women, secure attachment is related to a stable, partner-oriented sexuality. Some of these findings support a limited body of work on attachment and sexual behaviors in college students (e.g., number of partners, Brennan & Shaver, 1995; Miller & Fishkin, 1997), although our study extends this research by demonstrating such relations in a community sample. In addition, some measures (e.g., condom use) have not been reported elsewhere, to our knowledge, and thus are novel.

The significant attachment/sexuality relationships are also generally consistent with ideas from some evolutionary social scientists (e.g., Kirkpatrick, 1998) who have argued that adult attachment processes are psychological mechanisms that guide people into relevant life history/reproductive strategies. Thus, to the extent that adult attachment processes reflect early childhood experience with primary caretakers, children with less secure attachments to parents may ultimately adopt in adulthood an unrestricted or short-term reproductive strategy (e.g., early first intercourse, many short-term partners). A short-term mating strategy may be adopted because an unstable relationship with parents suggests their adult environments are likely to be unstable and not conducive to a stable long-term mating life history.

Our findings also contradict some prior research. For example, we found a positive relationship between secure attachment and self-reported physical attractiveness, but others have not (Tidwell, Reis, & Shaver, 1996; for research on this issue in children, see Rieser-Danner, Roggman, & Langlois, 1987). The difference may have occurred because we used self-report measures and Tidwell et al. used independent raters, or it may merely reflect the fact that we had more power, relative to Tidwell et al., to detect a small relationship that exists between attractiveness and attachment.

As mentioned, the results were stronger in women than in men. The present pattern of results suggests that women (more than men)

may be more sensitive to *internal working models* of interpersonal relations that ultimately affect their sexual behaviors (e.g., number of partners, condom usage). Other individual difference factors (e.g., hormones, sensation-seeking personality) may be more relevant for predicting men's sexual behaviors (see, e.g., Bogaert & Fisher, 1995). Perhaps women are more sexually sensitive to internal working models of interpersonal relations because they have, as Gilligan (1982) articulated, "a connected self" embedded in social relationships. As such, attachment processes may be more activated in women than in men under a variety of social, including sexual, circumstances. This explanation is consistent with the argument that women's sexuality is generally more malleable/plastic than men's in response to situational or environmental circumstances (Baumeister, 2000).

The present results may have implications for understanding high-risk sexual behaviors. For example, our findings suggest that women who score higher on insecure attachment may be at a higher risk for STDs (e.g., AIDS, genital warts, herpes) because they have an earlier first intercourse and more sexual partners, an important risk factor for STDs (e.g., Anderson & May, 1992). Indeed, the STDs variable loaded highly on Factor I (early first intercourse/many partners). Interestingly, there was evidence in women that anxiousness related to Factor V (condom use). However, this probably largely reflects the fact that more insecure people have a higher number of partners within a short duration, given that number of partners in one year loaded fairly highly on this (recent) condom use factor.³

One might speculate why attachment only accounted for a small amount of variation in sexual behavior. For example, the correlations were less than .20, a number of relations were eliminated after controlling for demographics

(e.g., income), and a number of sexual behaviors were unrelated (or only very weakly) to attachment (e.g., masturbation; sexual variety; erotophilia). One reason is that there are, of course, a number of individual difference factors, such as hormones and personality (e.g., sensation seeking), that can independently affect sexuality. As mentioned, some of these factors may be more relevant for predicting sexuality in one gender than the other (for men, see, e.g., Bogaert & Fisher, 1995). In addition, strong attachment/sexuality relationships may only be uncovered when partners or couples are assessed. For example, as mentioned, when avoidant men are paired with anxious women, a relationship may be prolonged (Kirkpatrick & Davis, 1994). Thus, particularly for those sexuality variables that are inherently interpersonal (e.g., frequency of sexual activity with a partner), researchers need to gather more information on attachment and sexuality from a large sample of couples. The modest results may also reinforce the notion that attachment processes may be relevant only under certain circumstances when the attachment system is "activated," as, for example, when one's sense of security is threatened by real or imaginary events/stresses (e.g., Stroufe & Waters, 1977; cf. Collins, 1996). In everyday adult life, these types of threat situations may be relatively rare. Thus, the range of social interactions (including sexual interactions) in which the attachment processes are active may be relatively narrow. Perhaps attachment processes may strongly predict sexuality (e.g., frequency of sexual behavior, number of partners or affairs) only when a relationship is threatened, such as when a partner has an affair.

Although it may seem reasonable to conclude that adult attachment processes, because of their conceptual linkage to infant attachment processes (e.g., Hazan & Shaver, 1987), have a direct, albeit small, effect on sexual relationships, there is some evidence that attachment can change in response to adult romantic relationships. Thus, attachment security and number of sexual partners may be modestly related (in women), but the direction of the relationship is unclear. For example, does a secure attachment cause fewer sexual

3. Note as well that number of partners in the past year (i.e., the "original," nonfactor-analyzed variable) significantly correlated ($r = .16, p < .01$) with anxious attachment in women, and there were no significant relationships between condom use (i.e., the "original," nonfactor-analyzed variable) and the attachment indices in women.

partners, or does a good long-term adult relationship cause secure attachment? Or, for example, does anxious attachment cause a young woman to be more likely to report an affair, or does her partner's affair foster an environment that encourages anxious attachment? Recent research on attachment stability (Davila, Karney, & Bradbury, 1999) suggests that both may occur. These findings raise intriguing possibilities about the interrelationships among attachment processes, sexuality, and possible life history/reproductive strategies. Specifically, can relatively recent life events alter attachment processes, which, in turn, ultimately affect sexuality and life history/reproductive strategies? Can a securely attached individual who has an unusual adolescent or early adult sexual experience (e.g., a very early sexual intercourse or partners repeatedly cheating on him or her) become less secure and thus begin to pursue multiple sexual partners (a "short-term" reproductive/mating strategy)? Longitudinal research with measures of both attachment and sexuality gathered at a number of different points of time in adolescence and adulthood may help to clarify the nature (e.g., direction-of-causality) of these relationships.

Limitations and conclusions

In most of the early adult attachment studies, investigators used the single-item categorical approach of Hazan and Shaver (1987) in which adults are asked to select one of three paragraphs that describe the classic three attachment styles: secure, avoidant, anxious-ambivalent. In our study, as in more recent attachment studies, we chose a continuous, multiple-item measure of attachment. We then constructed two attachment scales based on previous research using this scale. Use of such continuous, multiple-item measures may represent a psychometric and conceptual improvement over the original single-item,

categorical approach (e.g., Baldwin & Fehr, 1995; see also Fraley & Waller, 1998, for evidence that attachment measures are not taxonic). However, the reliabilities in the present study were modest, and our results should be replicated with other measures and other conceptions of these variables.

The limitations of our measures should also be noted. We employed standard paper-and-pencil measures of attachment and sexuality, but, as most researchers are aware, such methods have psychometric drawbacks. This is particularly the case for the assessment of human sexuality (e.g., affairs, masturbation, physical attractiveness), where, for example, social desirability and purposeful distortion can play a role (e.g., Catania, Binson, Van Der Straten, & Stone, 1995). There also may be interactions between the distortion of sexuality and attachment. For example, attachment processes may alter the reporting of physical attractiveness, with individuals higher in secure attachment reporting a high level of attractiveness because they have confidence in their relationships and their ability to attract a partner. Future research could explore whether such attachment \times sexuality distortions interactions do in fact occur.

Finally, the modest results raise conceptual issues about the nature of romantic love. In particular, although theorists often argue that romantic love involves the integration of sexuality, caregiving, and attachment (e.g., Shaver et al., 1988), our results suggest that attachment and sexuality are not necessarily highly interdependent. Thus, insecure attachment does not necessarily mean that one is destined, or even highly likely, to have a particular type of sex life (e.g., multiple partners), or, conversely, that a secure attachment necessarily leads to satisfying relations (e.g., more frequent sex behavior) with one's partner(s). Clearly, more research is needed on attachment and sexuality, with particular attention to the context of relationships.

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