

Original Article

**HOOK-UP BEHAVIOR: A BIOPSYCHOSOCIAL
PERSPECTIVE**

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Abstract

Hook-up behavior consists of sexual activity between uncommitted individuals. “Hooking up” has become pervasive among young adults, particularly on college campuses in the United States, despite inherent emotional, physical, social and health risks. A total of 507 undergraduate students were surveyed to assess the prevalence of, and motivations for, hook-up behavior. Of those students, 64% reported having ever engaged in a hook-up. Of those who had hooked up, 51% had done so with the intention of initiating a traditional romantic relationship; there were no sex differences. Contrary to established notions of uncommitted sexual activity as an evolved behavioral strategy, results are discussed from a synergistic biopsychosocial perspective that situates this complex sexual behavior at the intersection of evolution, basic biology, psychology, and novel cultural factors. A decreasing average age at menarche and increasing age of mother at first birth has created a window of sexually mature but pre-reproductive life that is historically unprecedented in its duration. We suggest this time window, paired with evolved neural correlates of sexual and reproductive behavior, greater acceptance of the social sexualization of youth, and characteristics of the modern collegiate environment, results in the increasing prevalence of hook-ups.

Keywords: hookup, casual sex, uncommitted sex, age at first reproduction, menarche, sexual behavior, evolutionary psychology, human mating strategies.

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Introduction

“Hooking up” has become a normative sexual experience on college campuses today (England, Shafer, & Fogarty, 2007; Paul & Hayes, 2002; Paul, McManus & Hayes, 2000), in spite of traditional dating and “steady” romantic partners amongst young adults. A hook-up broadly refers to an uncommitted sexual encounter between two people (defined below). “One-night stands” and “casual sex” are by no means a product of the 21st century, and uncommitted sexual experiences among college students have been studied without the current “hook-up” frame (Boswell & Spade, 1996; Cates, 1991; Maticka-Tyndale, 1991). However, the high prevalence of these behaviors, coupled with an openness to display and discuss them, appears to be recent, particularly amongst women. This is reflected in the fact that much of the research on hook-up behavior focuses *not* on particular sex acts *per se*, but rather on motivations, properties, and sequelae of the uncommitted relationship that exists between the actors.

The frequency of hook-ups varies from campus to campus, likely as a result of ecological differences between college environments, historical time of data collection, age of participants, and the demographics of the surveyed population. Paul, McManus and Hayes (2000) found approximately 78% of participants had hooked-up; two years later, Paul and Hayes (2002) reported that approximately 70% of undergraduate participants had engaged in a hook-up at least once in their college career. Lambert, Kahn and Apple (2003) found that approximately 78% of female and 84% of male participants had hooked up. More recently, England, Shafer and Fogarty (2007) reported that 76% of undergraduate seniors (fourth/final year students) had hooked-up at some point. This is indicative of a nationally representative study of individuals ages 12-21, where of those who were sexually experienced, 70-85% reported having engaged in a casual sex experience within the last year (Grello, Welsh, Harper, & Dickson, 2003).

What “hook-ups” are

A “hook-up” is a spontaneous sexual interaction in which: 1) the individuals are explicitly *not* in a traditional romantic relationship with each other (i.e., not dating, not boyfriend/girlfriend), 2) there are no *a priori* agreements regarding what behaviors will occur, and 3) there is explicitly *no* promise of any subsequent intimate relations or relationships. The hook-up can comprise various sexual behaviors, and may include any or all of the following: heavy kissing and/or petting, oral sex, anal sex, mutual masturbation, and/or intercourse. Hook-ups have been most commonly reported to occur at parties, dormitories, fraternity houses, bars and clubs, or any other available forum (Paul & Hayes, 2002). Alcohol and other drugs often facilitate hook-up experiences (Lambert, Kahn, & Apple 2003; Paul & Hayes 2002) and drastically increase the overall risks (Abbey, Ross, McDuffie, & McAuslan, 1996). More generally, alcohol consumption is known to have a direct link with willingness to engage in actualized casual sex, among both men and women (Grello et al., 2003).

What “hook-ups” are NOT

Hook-ups differ from other types of uncommitted intimate relationships and encounters. This differentiation is important because the intent and motivation for this type of sexual encounter may also differ. First, hook-ups are not “casual” or “open”

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relationships. Although “casual” relationships can have relaxed restrictions on extra-pair sexual interactions, and sometimes less partner-based responsibility and effort than traditional romantic relationships, they still typically include a traditional romantic component that distinguishes them from hook-ups. Second, hook-ups are not the same as “friends with benefits,” sometimes also colloquially called “booty calls” (Jonason, Li & Cason, in press). While “friends with benefits” engage in a recurring sexual contract of sorts, which includes frequent sexual activity without dating, romantic commitment, or outward attachment (Grello, Welsh, & Harper, 2006), they do maintain an underlying friendship that distinguishes them from acts of hooking up. Third, hook-ups differ from prostitution, in which a sexual interaction is part of a business arrangement. In contrast, a hook-up is typically a self-motivated action by two consenting (at least initially) parties without remuneration of any sort. Fourth, hook-ups differ from the stereotypical “one-night stand,” in which the woman is generally seen to have been victimized by a scoundrel who reneged on a promised or implied ensuing relationship. In a hook-up both parties know upfront that there is no promise of continuing interaction or relationship. Finally, it is important to consider how hook-ups relate to and differ from “extra-pair copulations” (EPCs), or sexual encounters with a partner other than one’s pair-bonded mate. In a hook-up, the individuals are explicitly not in a relationship with *each other*. However, it remains unclear what proportion of hook-ups represent an act of infidelity on the part of one or more of the actors. For someone in a committed relationship, an EPC may or may not be a hook-up, depending on the actor’s intentions toward the partner in the EPC.

Evolutionary perspectives on sexual behavior

Although human sexual behavior has been examined via numerous theoretical lenses, here we employ evolutionary principles as an overarching metatheory for our discussion of the combined biological, psychological, and social influences on hook-up behavior. Inasmuch, we abandon a strict social constructivism agenda, and instead consider how underlying biology interacts with a particular cultural setting to produce behavior. An evolutionary perspective suggests that the fundamental forces driving survival and reproduction are at the core of human purposive behavior. There exists an incredibly rich body of literature investigating human sexual and reproductive behavior from an evolutionary perspective (e.g., Buss, 2003; Daly & Wilson, 1983; Fisher, 1992; Gaulin & McBurney, 2004; Low, 2000). In this perspective, the human mating system is mildly polygynous with tendencies for social monogamy, resulting from a higher maximum potential reproductive rate in males than in females. That is, males are capable of producing offspring at a faster rate than are females, who are physiologically bound to gestate and lactate for many months to produce even a single offspring. Sex differences in sexual/reproductive behavior and attitudes follow from this basic difference. Males are expected to be more sexually eager, while females are expected to be choosy concerning mates and the allocation of reproductive effort.

Previous research on *uncommitted* sexual behavior has often classified it as an evolutionarily fitness-enhancing behavioral strategy (e.g., Buss, 2003; Buss & Schmitt, 1993) and focused attention on individual differences in sexual proclivities (e.g., Simpson & Gangestad, 1991). This classification supports the view of men preferring many short-term relationships, thereby maximally commandeering female reproductive potential while investing minimally, except when conceding and “settling down” to raise offspring

(e.g., Buss, 2003; Buss & Schmitt, 1993; Geary, 2000; Trivers, 1972). However, it is more difficult to explain casual sex for women in this view, since the proposed archetypal “coy” woman is expected to prefer a long-term relationship to ensure the extraction of resources and protection from her mate. Thus, when women actually do engage in short-term sex it has been reconciled as an exchange: women engage in short-term infidelities to steal the superior genes of their extra-pair partner. This scenario has been argued to explain the sex differences in tolerance for emotional versus sexual infidelity, and ensuing jealousy variants (Buss, 2000; Buss, Larsen, Westen, & Semmelroth, 1992; Miller & Maner, 2008).

However, human reproductive behaviors around the world do not always strictly conform to the implications of such sexual dimorphisms. Mating systems and behaviors are context-specific and vary to include both long-term and short-term fitness-relevant behaviors as ecologically adaptive (Borgerhoff Mulder, 2004; Boyd & Silk, 2006; Low, 2000; Smith, Borgerhoff Mulder, & Hill, 2001). The Cooperative Breeding Model (see Hrdy, 1999, 2005), for example, suggests that humans produce and raise offspring in the presence of interwoven social networks, with maternal, paternal, and alloparental support. In addition, evolved systems for jealousy may be more general than previously purported in sexually dimorphic, mating strategy-specific adaptations (see Harris 2003, 2005). An evolutionary framework can still indicate females may desire more than bonding with males (for support and protection), and males may desire more than sex with females (for offspring gestation). Moreover, uncommitted sexual behavior is quite common in women, and does not always conform to the constraints of the evolved behavioral strategy approach.

Sexual behavior sits at the intersection of human biology (anatomy, physiology, neurology, endocrinology), psychology, and culturally-relative norms, and facilitates both reproduction and romantic attachment. Contemporary hook-up behavior presents an opportunity to study gender differences in sexual motivation and intention. Individuals seem to be capitalizing on only the biophysical module underlying sexual behavior; that is: sex is pleasurable, and one can engage in sex and maximize pleasure. To the extent that sexual pleasure tends to correlate with fitness, males would be evolutionarily favored to engage in short-term sexual behavior, including hook-ups. But why would evolutionarily “coy” human women behave this way, given the assurance of no resource transfer, no gene transfer, and no continuing relationship? Certainly modern women can minimize risks of sexually transmitted infections and pregnancy by using birth control and/or prophylactics such as condoms. However, these risk-reduction measures should be inadequate to produce behavior that conflicts with millions of years of selection pressure for coy females. First, they do not address potentially fitness-reducing psychological and social risks. And second, conscious knowledge of modern technologies is not expected to override evolved patterns. Although modern technologies and cultural innovations may present novel behavioral options, the underlying structure of motivational drives influencing behavior is not expected to change drastically. For example, in modern Western countries, supermarkets may supplant hunting, but the underlying motivation to eat remains unchanged. This is consistent with gene-culture coevolution theory which suggests that our underlying biology can at times be a leash that binds our vastly complex social structure (Richerson & Boyd, 2005). Humans must attempt to reconcile what are at times contradictory notions of fulfilling psychological desires for compatible (seemingly long-term) romantic partners with biological desires for attractive (seemingly short-term) sexual partners.

Current Study

The current study adds to the relatively small body of existing literature on hook-up behavior by assessing the prevalence of, and motivations for, hook-ups. We characterize this behavior as more than simply the pairing of a fundamental sex drive with loss of inhibition due to alcohol or substance use. Exploring the motivations can provide insight into the role of libido, emotional gratification, social pressures, and accident in directing uncommitted sexual activity. We predict that physical/sexual gratification will be the leading factor underlying hook-ups. We also predict that many individuals who engage in hook-ups -- particularly women -- will report having done so with the intention of initiating a more traditional romantic relationship. Further, we predict that a large proportion of men will also endorse this motivation, because substantive aspects of the neural correlates underlying sex and attachment are sexually monomorphic.

We attempt to provide a novel approach to understanding the presence of hook-up behavior while appreciating the multiple influences involved. Contrary to expectations of modern evolutionary psychology and gender differences in mating behavior, relatively little sex difference is reported in the literature on hook-ups; hooking up is reportedly as common amongst women as men. But for women, the costs of short-term sex loom large, suggesting that this sexual expression may be a normative activity rather than a short-term strategy per se. Any explanation of this behavior must take into consideration the lack of sex differences in engagement, as well as reported motivations and novel modern environments and influences.

Method

Materials and Procedure

This research was conducted in accordance with guidelines for the use of humans as research subjects, and was approved by the university's Human Subjects Research Review Committee. Participants completed a 70-item self-report questionnaire containing demographic information and data about their history of sexual behavior and intimate relationships. The questionnaire focused on experiences and motivations surrounding hook-up behavior. At the beginning of the questionnaire, hook-up behavior was defined for participants as follows: "A hook-up is a sexual encounter between people who are not dating or in a relationship, and where a more traditional romantic relationship is NOT an explicit condition of the encounter."

The questionnaire was administered electronically via Student Voice (www.studentvoice.com), a higher-education assessment provider. The questionnaire was uploaded and formatted to their web-based survey tool. A sample of 1,000 undergraduate email addresses was randomly generated from the population of approximately 14,000 undergraduates currently attending the university, and a voluntary recruiting email was then sent to this sample. The recruiting email requested the student's participation in the study, and had instructions to follow a provided link to the web-based survey. While this study utilized the World Wide Web, it did not fall prey to the many problems associated with random web-based surveys, because it was targeted

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at, and available to, only specific individuals for participation. Use of the internet simply provided an expedient and efficient means of data collection. Participants were notified that the study was completely anonymous and that they could skip any question(s) they did not wish to answer. Following the email, 653 students responded to the invitation by logging into the system and reading the introductory materials (informed consent and description of the survey). Of those, 507 (77.6%) continued and completed a majority of the questionnaire, providing the data analyzed here.

Examples of relevant questions asked in this survey are:

- Why do you engage in hook-ups? (Check all that apply)
 - Physical/sexual gratification
 - Emotional gratification
 - Others are doing it
 - My friends and peers pressure me to do it
 - To initiate a relationship
 - Unintentional (i.e., due to drugs and/or alcohol)
- How do you expect most of your hook-ups to end?
 - In friendship
 - In a traditional romantic relationship
 - Further hook-ups with the person
 - Nothing more
- Ideally, how would you like hook-ups to end?
 - In friendship
 - In a traditional romantic relationship
 - Further hook-ups with the person
 - Nothing more

Participants

Participants included 507 undergraduate students at Binghamton University, State University of New York (SUNY). The sample was 55% female ($n = 277$) and 45% male ($n = 227$). The mean age of participants was 19.7 years ($SD = 1.7$). Participants included 42% ($n = 214$) first-year students, 28% ($n = 140$) second-year, 16% ($n = 82$) third-year, and 14% ($n = 71$) fourth-year students.

Self-reported ethnic identification comprised 66% ($n = 333$) White/Caucasian, 14% ($n = 72$) Asian/Pacific Islander, 6% ($n = 32$) African American, 6% ($n = 31$) Hispanic, 4% ($n = 22$) bi-racial/other, and 3% ($n = 17$) did not respond. Additionally, 88% ($n = 447$) reported being US-born versus 12% ($n = 56$) non-US-born. Furthermore, 68% ($n = 341$) reported growing up in a suburban setting, 23% ($n = 115$) in an urban setting, and 10% ($n = 48$) in a rural setting. Self-reported socioeconomic status varied greatly; 3% ($n = 13$) reported upper class, 37% ($n = 184$) reported upper-middle class, 45% ($n = 229$) reported middle-middle class, 14% ($n = 69$) reported lower-middle class, and 2% ($n = 9$) reported lower class.

Results

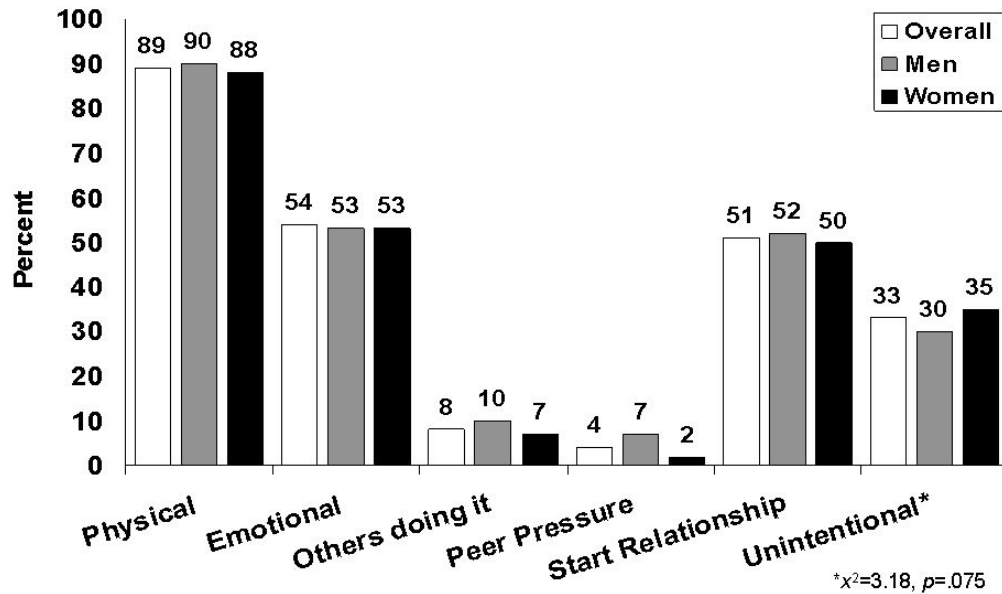
Overall, 72% ($n = 358$) of participants reported having attempted to initiate a hook-up at least once, and 64% ($n = 311$) reported having actually hooked up. Of those who reported never having tried to initiate a hook-up ($n = 142$), 75% reported that they do not ever wish to do so. When asked to identify the (potentially multiple) categories of individuals with whom they engaged in sexual behaviors, 66% of participants reported traditional romantic partners, 30% reported friends, 30% acquaintances, 13% strangers, and 16% reported having sex with no one. In total, 67% of participants (66% of women and 67% of men) reported having engaged in sexual intercourse, and the mean age at first intercourse was 16.8 years ($SD = 1.7$; no gender differences). Of first intercourse experiences, 34% were reported to have been in the context of a hook-up. Mean age at first hook-up was 16.4 years ($SD = 2.1$).

The responses concerning these sexual behaviors differed by gender. Of men, 80% reported having tried to initiate a hook-up; of women, 65% reported having tried to do so ($X^2(1, N=497) = 13.4, p < .001$). Interestingly, 64% of each gender reported having actually hooked up. While 50% of men reported having engaged in sexual behaviors with traditional romantic partners, 72% of women reported having done so ($X^2(1, N=331) = 12.8, p < .001$). Further, 34% of men and 26% of women reported having sex with friends. While 38% of men reported having sex with acquaintances, only 23% of women reported doing so ($X^2(1, N=151) = 3.5, p = .06$); and while 20% of men reported having sex with strangers, only 8% of women reported doing so ($X^2(1, N=67) = 7.9, p < .005$). Finally, 19% of men and 14% of women reported having sex with no one.

Those participants who reported actually having hooked up ($n = 311$) were asked to identify their (possibly multiple) motivations for having done so (see Figure 1). Overall, 89% of these participants identified physical pleasure as a motivation. At the same time, 54% identified emotional reasons for hooking up. While 8% indicated having been motivated by the fact that others are doing it, 4% indicated immediate peer pressure to engage in hook-ups. Additionally, 33% of participants who had hooked up reported that the hook-up was unintentional, likely due to alcohol and other drugs, and thus lacking intrinsic self-reported motivational factors. Finally, 51% of participants -- and equally for both men and women -- reported hooking up as a way to potentially initiate a traditional romantic relationship.

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Figure 1. Percent Endorsing Various Motivations for Hooking Up, By Gender



Interestingly, there were no significant gender differences in motivations behind hook-ups (see Figure 1). While slightly more men than women reported peer pressure as a motivating factor (7% versus 2%, respectively; *n.s.*), and slightly more women than men (35% versus 30%, respectively; $X^2(1, N=102) = 3.18, p=.075$) reported hook-ups to be unintentional, physical and emotional motivations and the intention of using a hook-up to start a traditional romantic relationship were cited as motivations by equal proportions of men and women.

Participants' expected and ideal outcomes after a hook-up are shown in Table 1. Very few participants (6%) actually expected hook-ups to result in traditional romantic relationships, although over one-third (37%) indicated that ideally they would. Slightly less than one-third (30%) expected hook-ups to result in nothing more between the participants, although very few (13%) indicated that this would be ideal. For both men and women, the most common expected outcome following a hook-up was further hook-ups (43% for men and 36% for women). However, the ideal outcome following a hook up differed by gender, with the highest proportion of men (32%) hoping for additional hook-ups, but the largest proportion of women (43%) hoping for a traditional romantic relationship.

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Table 1. Participants' expected and ideal outcomes after a hook-up (%)

	Overall	Men	Women
<i>Expected outcome</i>			
Friendship	24.19	21.01	26.90
Further hook-ups	39.03	43.48	35.67
Nothing more	30.32	31.16	29.24
Traditional romantic relationship	6.45	4.35	8.19
<i>Ideal outcome</i>			
Friendship	26.21	23.91	28.24
Further hook-ups	23.95	31.88	17.06
Nothing more	13.27	15.22	11.77
Traditional romantic relationship	36.57	28.99	42.94

Virtually all participants (>99%) indicated that at some point in their life, they would like to be in a traditional romantic relationship. Of all participants, 38% reported already being in a traditional romantic relationship, and 62% reported that although not currently in such a relationship, they would like to end up in one. Only 2 participants (less than 1%) indicated that they would not like to be in a traditional romantic relationship at some point.

Discussion

Limitations

This study is limited by the possibility that the sample may not be truly representative of the undergraduate student population. Of the 1,000 randomly selected recruiting emails sent, 653 self-selected to follow the link and obtain more information concerning the study, and of those, 507 self-selected to participate. While the email addresses for recruiting were randomly selected from the university student body, there is no way to ensure that the final 507 who participated are representative of the original population. However, the prevalence of hook-ups found in this study is similar to that reported by others (England, Shafer, & Fogarty 2007; Lambert, Kahn, & Apple 2003; Paul & Hayes 2002; Paul, McManus, & Hayes 2000), suggesting a fair level of generalizability. Continuing studies of sexual behavior at the university will provide ongoing clarification and refinement of these estimates.

Motivating factors for hooking-up

While respondents reported multiple concomitant factors motivating hook-ups, the most frequently endorsed (89%) motivation for hook-ups was physical/sexual gratification. The libido motivates a vast majority of hook-ups. Thus, it is perhaps fitting, if not unsettling, that alcohol and/or other disinhibiting substances are frequently associated with hook-ups. Overall, it appears that young adults are having sex for pleasure in addition to other possible motivating factors. Slightly over half of all participants -- both men and women -- also reported emotional gratification as a

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motivational factor. This suggests that a cognitively-driven desire for intimacy also underlies this sexual activity.

Approximately half of all subjects also indicated the intention of using the hook-up to initiate a traditional relationship. Considering the basic uncommitted premise of hook-ups, this may seem faulty reasoning. However, our data (Table 1) indicate that participants are aware of this discrepancy. While participants reported a very low *expectation* of a romantic relationship resulting from a hook-up, a very large proportion indicated that such a progression into a relationship would be ideal. This is likely because the human mind contains strong proclivities for both physical gratification and social attachment.

Approximately one-third of participants indicated that their hook-ups occurred unintentionally. Some portion of this is likely related to alcohol and/or substance use, and presents a considerable risk to the health and safety of young adults. Additionally, those reporting unintentional hook-ups may not be actively aware of any impetus, if not simply in denial and unwilling to accept such motivations. Finally, social influences such as peer pressure and interest in copying others appeared to play a relatively small roll in motivating hook-ups.

These findings support our predictions. As predicted, a substantial number of individuals were engaging in hook-ups primarily for sexual gratification. Many also had the intention of initiating a relationship (see Figure 1), even though there was discordance between ideal and expected outcomes. While approximately 37% (29% of men and 43% of women) reported a traditional romantic relationship as the *ideal* outcome of a hook-up, only about 6% (4% of men and 8% of women) actually *expected* a hook-up to result in a traditional romantic relationship (see table 1). This indicates that the innate desire for a relationship is quite powerful, and can (and often does) lead to relationship-typical (sexual) behavior even when conscious awareness and all external cues suggest the probability of an actual relationship is really quite low. Although these factors tell us why some individuals are engaging in hook-ups, they do not tell us how it is that hook-up behavior has become such a widespread contemporary phenomenon.

How has the hook-up become normative behavior?

While evolutionary arguments suggest greater sex-specific emphasis on certain aspects of reproductively-relevant behaviors, ultimately *both* men and women want intimacy, sex, and love. It is clear from our data that men want more than sex. However, it is not evolutionarily surprising that men engage in hook-ups, given the small cost and potentially large reproductive benefit. But the question remains: why are contemporary women behaving this way? Our data indicate that only 8% of women expect a traditional romantic relationship to result from a hook-up encounter. Moreover, there are high potential costs to women for engaging in casual sex.

We propose that hook-up behavior may result from two diverging life history trends. The age of menarche -- the onset of menstrual cycling in females -- may signal the beginning of biological capacity to reproduce. Various sources of data suggest a secular trend of decreasing average age of menarche among contemporary women (Anderson & Must, 2005; Steingraber, 2007; Stinson, 2000; Wyshak & Frisch, 1982). Using various older European datasets, estimates from the early to mid-1800's suggest that average age of menarche was roughly between 15 and 17 years (cf., Tanner 1962). Estimates from the late 1800's in the United States indicate that the age of menarche was

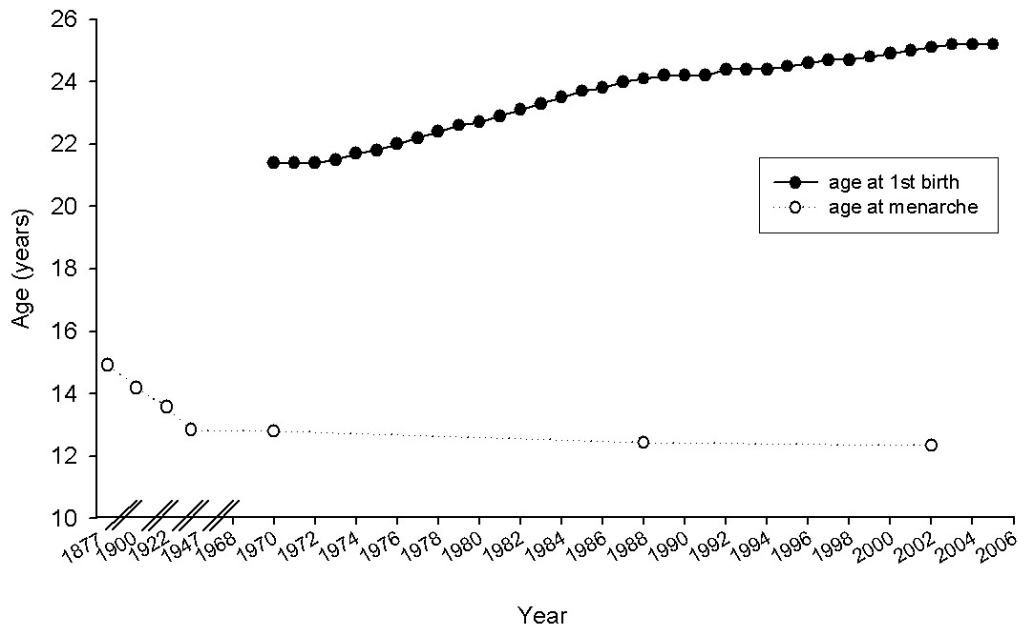
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approximately 14.75 years; while current estimates in western industrialized nations are nearly 12 years of age.

The actual age at first reproduction does not necessarily immediately follow menarche. Available data from the United States suggest that women's age at first reproduction has consistently risen since the 1970's (using data collected for the Centers for Disease Control and Prevention: Martin et al., 2002, 2003, 2005, 2006, 2007; Mathews & Hamilton, 2002). It is estimated that between 1970 and 2005, the average age of mother at first birth rose from approximately 21.4 to approximately 25.2 years.

Contemporary young women have no reason to expect to reproduce for a substantial amount of time (i.e., more than a decade) post-menarche. In fact, the tendency to settle into a stable lifestyle with a partner and ensuing children has altogether been pushed back to later in life. The younger age at menarche paired with the older age at first birth in modern western industrialized societies results in a dramatic gap between the two, currently exceeding a decade (see Figure 2, data from published historic data for age at menarche and publicly available health statistics from the U.S. Centers for Disease Control and Prevention). This gap, approximately 13 years at current, is exceptionally striking when compared to the much shorter time period of 3 years that separates menarche and first birth for women in ancestral and preindustrial environments (Eaton et al., 2002). The etiology of these trends, although beyond the scope of this article, remains contentious and has important social and health implications, thus requiring continued review and study.

Figure 2. Historical Change over Time in Age at Menarche and Age at First Birth



This disconnect results in the increased decoupling of reproductive capability and actual reproduction. We suggest that, at over a decade, the contemporary time span between menarche and first reproduction provides a window for sexual opportunity and exploration not previously available (see Figure 2). This window, coupled with the high sexual content of mainstream media and subsequent outward sexual socialization of American youth (Brown, Steele, & Walsh-Childers, 2002; Ward, 2003), likely promotes sexual activity and exploration beyond the traditional pair-bonded relationship. At some point the human mind and body will undoubtedly attempt to do what it is most primitively programmed to do -- have sex. In fact, data collected from 2002 in the United States suggests that despite strong Judeo-Christian sentiment, 95% of respondents had premarital sex by age 44, a trend that has not changed much in the past few decades (see Finer, 2007). Although reproduction has been delayed, the basic psycho-sexual systems may not be thwarted as easily. This is supported by the endorsement of physical/sexual gratification as the primary motivational factor for hook-ups -- equally by women as well as men -- even in the absence of a committed partner.

We have not tested and do not show similar data for males. It should be noted that pubertal onset in males is not as readily assessable as it is with females (i.e., first menstruation). Similarly, male's age at birth of first child is not readily assessable, and is not as intrinsically tied to life-history timing. However, that men engage in short-term uncommitted sexual activity is parsimonious with well-established evolutionary principles, and thus requires no alternative explication.

This approach can help explain why *women* and *men* are engaging in hook-ups at the same frequency, in addition to self-reporting the same motivational factors. Traditional evolutionary theories about sexuality do not account for women engaging in sexual activity for reasons other than fitness-relevant reproduction, obscuring fundamental influences on choosing a partner (see Strout, 2006). But by appreciating the simple shifts that have occurred in the timing of programmed life history stages, a window appears in which both men *and* women are having sex just to have sex. This is supported by a cultural context that allows the sexual socialization of youth (Ward, 2003) and a social milieu that facilitates this behavior, such as a university campus setting (Elliott & Brantley, 1997).

Neural correlates of intimate relationships

Underlying these life history stages are complex proximate mechanisms. The motivations for reproductively-relevant behaviors such as sexual interests and attachment formation can be partially traced to the evolved brain. Insights from behavioral neuroscience, particularly behavioral neuroendocrinology, suggest that romantic attachment formation and romantic love are hard-wired into the human brain (Carter, 1998; Depue & Morrone-Strupinsky, 2005; Fisher et al., 2002). The capacity for human love, with all its dramatic allure, is believed to have evolved to guide successful reproduction via mate-choice and the formation of stable pair-bonds (Fisher, 1992).

Helen Fisher and colleagues have suggested three specific and highly interconnected motivational brain systems with corresponding hormones that have evolved to direct reproduction (Fisher, 1998; Fisher, 2004; Fisher et al., 2002): *lust* (the sex drive), *attraction* (passionate romantic love and infatuation), and *attachment* (sense of calmness and security). Of particular importance, hormones such as oxytocin, dopamine, and testosterone seem to be influential in mediating social attachment,

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romantic attraction, and libido, respectively (Carter, 1998; Depue & Morrone-Strupinsky, 2005; Fisher et al., 2002). This suggests a neurobiological basis for the expectation of universal gender-irrelevant human tendencies for both long-term social attachments *and* short-term sexual encounters.

The drive for social attachment and bonding is fundamental to our lives (see Carter et al., 2005), just as sexual reproduction is fundamental to our fitness. Therefore, we should expect individuals to optimally attend to both. This is consistent with more than 99% of our participants reporting wanting to be in a traditional romantic relationship at some point in their life -- it is wired into the brain. At the same time, sexual activity -- even if non-reproductive -- is hard-wired into the brain as well. These complementary motivations exist with variable intensity throughout life.

Implications for Human Mating Strategies

Hook-up behavior does not easily fit the traditional evolutionary approaches to human mating strategies. Data shown here do not support the expected patterns of sexually dimorphic motivation, expectation, and behavior. This does *not* suggest that this plentiful body of literature should be altogether abandoned; sexual strategies theory (Buss & Schmitt, 1993) has spawned an array of research with fascinating and useful results. However, this paradigm has not fully taken into account actual contemporary sexual experiences or interests of women (Strout, 2006). Hook-up behavior, with similar frequencies and motivation for men and women, is a case in point. Hook-up behavior may be a distinct sexual phenomenon rather than a traditionally-conceptualized behavioral strategy. This is particularly true with respect to females, who alone bear enormous biological risk by engaging in sexual encounters. Further, this is true if young adults today have an interest in both long-term pair-bonding, or traditional romantic relationships, and short-term uncommitted sexual encounters, or hook-up behavior. The findings shown here suggest that young adults today desire both emotional and physical fulfillment, consistent with neuroscientific suggestions that both are intrinsic to the evolved human brain. Ultimately, the desire to be in a traditional romantic relationship is a powerful motivator of hook-up behavior for young adults in college environments, even though many of them don't actually expect such a relationship to follow. Given the current sociocultural climate, many of these students are perhaps not interested in pair-bonding and being "settled" anytime soon. This is likely indicative of a perpetuated layer of denial on the part of the actors -- although an internal urge to have a companion exists, that urge can be satiated in the short term with a partner willing to show affection and attention, if even on a solely physical stratum. These multiple influencing factors suggest the need to consider contemporary sexual behavior from a biopsychosocial perspective to appreciate the combined contributions of underlying biology, psychological processes, and societal structure.

Conclusion

Hook-up behavior is a major component of the lives of young adults today, and poses serious risks, highlighting the importance of appropriate and effective sexual health education. In spite of this, it has received only a relatively small amount of scientific attention. The research presented here adds to the existing body of literature and furthers

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our knowledge of the prevalence of, motivations for, and ideal and expected outcomes of hook-up behavior. It is not surprising that on college campuses, where sexually mature, pre-reproductive individuals live in residence halls with access to others and minimal “adult supervision,” there exists a high frequency of sexual activity. That the normative expression of this sexual activity has become the hook-up, however, requires explanation in the face of the apparent conflicts with existing predictions of evolutionary theory. The current research presents a novel approach to explain this complex sexual behavior at the intersection of evolution, basic biology, psychology, and modern cultural factors. The divergence in age at menarche and first reproduction in modern women has created an historically unprecedented window of time during which modern cultural factors allow sexual maturity to be expressed through sexual behavior in the absence of stable commitments characteristic of reproductive life -- that is, hook-ups. Understanding how young adults manage their cravings for sexual gratification while also addressing urges for partnership and attachment elucidates the very nature of these reproductively-relevant processes. A shift to increasing frequencies and public acceptance of hook-up behavior may drive larger shifts in the contemporary arenas of courting, dating, engaging in sex and being in love.

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