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Commitment in Romantic Relationships*

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Running head: COMMUNICATING ROMANTIC COMMITMENT

Let's Get Serious:

Communicating Commitment in Romantic Relationships

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Abstract

Are men or women more likely to confess love first in romantic relationships? And how do men and women feel when their partners say “I love you”? An evolutionary-economics perspective contends that women and men incur different potential costs and gain different potential benefits from confessing love. Across six studies testing current and former romantic relationships, we find that although people think that women are the first to confess love and feel happier when they receive such confessions, it is actually men who confess love first and feel happier. Consistent with predictions from our model, additional studies show that men’s and women’s reactions to love confessions differ in important ways depending on whether the couple has or has not engaged in sexual activity. These studies demonstrate that saying and hearing “I love you” has different meanings depending on who is doing the confessing and when those confessions are made. Beyond romantic relationships, an evolutionary-economics perspective suggests that displays of commitment in other types of relationships, and reactions to these displays, will be influenced by specific, functional biases.

Keywords: evolution, signaling, romantic relationships, bias, love

I love you. These three little words have inspired eons of hope and devotion, sacrifice and tragedy. Even today, the statement “I love you” represents more than an expression of feelings; it represents a commitment to future behavior. One’s initial confession of love to a romantic partner signals a desire to segue from short-term fling status to a more serious, long-term relationship. However, despite the relatively straightforward nature of this statement, a deeper look into the communication of commitment reveals a complex web of intentions and perceptions about which exists many common misconceptions.

In this paper, we examine the timing and function of communicating “I love you” in romantic relationships by applying an economic-exchange perspective that draws on social and evolutionary theories in specifying particular trade-offs likely to influence people’s romantic endeavors (e.g., Ackerman, Huang, & Bargh, in press; Ackerman & Kenrick, 2008; Baumeister & Vohs, 2004; Buss & Schmitt, 1993; Campbell, Simpson, & Orina, 1999; Gangestad & Simpson, 2000; Gonzaga & Haselton, 2008; Griskevicius et al., 2007; Haselton & Nettle, 2006; Hill & Reeve, 2004; Kenrick & Trost, 1989; Li, Bailey, Kenrick, & Linsenmeier, 2002; Miller, 2000; Saad & Gill, 2003). Drawing on this theoretical perspective, we consider questions such as: Do people believe that women or men are more likely to feel and confess love first in a new relationship? Who is actually more likely to confess first and why? And how do people react to confessions of love? By focusing on the timing and the function of “I love you” expressions, we investigate how and why people convey commitment through confessions of love, and the manner in which love confessions may represent functional solutions to people’s romantic goals. The theoretical approach and research we present not only provide insight into the communication of commitment in the romantic realm, but they also suggest intriguing

possibilities for commitment displays in other types of relationships, including friendships, teams, families and occupational settings.

Research on Romantic Love

People do of course express love within a variety of different types of relationships, from romantically-involved couples to genetically-related families to same-sex friendships. These forms of love are quite distinct, however, and rely on different proximate mechanisms and decision rules (Kenrick, 2006). For example, the love that binds family members together is typically associated with inhibition of sexual desire (Lieberman, Cosmides, & Tooby, 2003), but quite the opposite is true for the romantic love within couples. It is this latter form of love that has tended to inspire the pens of poets and paintbrushes of artists throughout the ages, as well as much of the research of psychologists. Although our theoretical perspective is relevant to the communication of love and commitment across different types of relationships, in the current paper we focus on the communication of love and commitment in romantic relationships.

Empirical and theoretical approaches to love have taken a number of tacks (Clark & Reis, 1988), including studies of the phenomenology of the experience (Berscheid & Walster, 1978; Gonzaga, Turner, Keltner, Campos, & Altemus, 2006; Hatfield, 1988; Sternberg, 1986), conceptual properties (Fehr & Russell, 1991; Hendrick & Hendrick, 1986), the ideology of romanticism (Cunningham & Antill, 1981; Specher & Metts, 1989), and the physiological and neural substrates of love (Diamond, 2003, 2004; Fisher, Aron, & Brown, 2005, 2006). Others have focused on love's origins, construing love as a set of evolved decision biases that emerge through dynamic interactions with the decision biases of other individuals as well as with cultural norms (Buss, 2006; Kenrick, 2006; Kenrick, Li & Butner, 2003). Several investigators have emphasized a multi-component approach to love, suggesting that intimacy and passion are

relatively orthogonal elements (Hatfield & Rapson, 1993; Sternberg, 1986). From this perspective, the first confession of love in a romantic relationship is generally considered to be an expression of one's intimate feelings and desire for commitment (see also Campbell & Ellis, 2005; Gonzaga & Haselton, 2008; Gonzaga, Keltner, Londahl, & Smith, 2001).

Gender Differences

Much of the existing research has emphasized gender differences in romantic relationships such that women are generally thought to be more interested in and willing to express love and commitment than men (e.g., Balswick, 1988; Pellegrini, 1978). For instance, women are often stereotypically associated with stronger feelings of love than are men (Fabes & Martin, 1991; Pines, 1998). A content analysis of emotional expression in Valentine's Day cards, for example, found that women were more likely than men to express love and fidelity (Gonzalez & Koestner, 2006). Women are also thought to be relatively more disposed than men to long-term mating strategies, indicative of romantic commitment (Buss & Schmitt, 1993; Kenrick, Sadalla, Groth, & Trost, 1990; Peplau, 2003; Simpson & Gangestad, 1992), and women become relatively more upset by emotional (love- and commitment-related) infidelity than men do (Sagarin, 2005). Finally, women may have an easier time than men expressing vulnerable emotions like love (Grossman & Wood, 1993; Notarius & Johnson, 1982; Sprecher & Sedikides, 1993). Work on self-disclosure confirms that women are typically more likely to reveal intimate details than men are (e.g., Morgan, 1976).

Despite this evidence, several studies have found that men are actually more likely to hold certain romantic beliefs, such as that one should marry for love, or that love is everlasting (Cunningham & Antill, 1981; Knox & Sporkowski, 1968; Peplau & Gordon, 1985; Sprecher & Metts, 1989; but see Garcia & Carrigan, 1998; Medora, Larson, Hortacsu, & Dave, 2002). Such

findings are often accounted for by presuming that men possess relatively greater economic freedom and can thus afford to select partners on the basis of love (Dion & Dion, 1985). Men have also been found to divulge personal information more readily than women in their initial meetings with strangers (Derlega, Winstead, Wong, & Hunter, 1985). This type of disclosure is thought to be driven by socialization pressures that lead men to desire control of the relationship.

Timing

Within the close relationships literature, some research has focused on periods of romantic development characterized by discrete events, or “turning points” (Baxter & Pittman, 2001; Baxter & Bullis, 1986; Bullis, Clark, & Sline, 1993). These points signal the onset of positive or negative change in the satisfaction or commitment level of relationships. In a classic study, Baxter and Bullis (1986) identified a number of important turning point categories including “get-to-know time,” “physical separation,” and “external competition.” Of particular relevance for the current paper, events related to the “passion” category, specifically “first sex” and saying “I love you,” represented only 3% and 1.2% respectively of all turning point events.

As we will suggest below, the frequency with which these particular events are reported may belie their importance. Indeed, several researchers have focused on the meaning and relational effects of sex and love as key experiences. For instance, it has been suggested that the expressing love prior to sexual intimacy may counter typical cultural norms and thus intensify emotional engagement (Metts, 2004). In a study of first sexual involvement in romantic relationships, Metts (2004) found that expressions of love before sex positively predicted relationship escalation and negatively predicted regret about sex. Again, research indicates that women may be especially responsive to emotional cues of love and commitment as reasons for advancing sexual activity in relationships (Carroll, Volk, & Hyde, 1985; Christopher & Cate,

1984). Indeed, early love confessions appear to be stronger predictors of relationship escalation for women than for men, though interestingly, these confessions do not necessarily predict current relationship satisfaction or commitment (Metts, 2004). In the current research, we propose that timing and gender are critical factors for illuminating the ultimate function of romantic love confessions because these factors speak to the successful exchange of evolutionarily important resources.

An Evolutionary-Economics Perspective on Romantic Commitment

An evolutionary perspective has been particularly fruitful in accounting for the costs and benefits underlying specific patterns of romantic behavior (e.g., Ackerman & Kenrick, 2008; Buss, 2006; Campbell & Ellis, 2005; Fletcher, Simpson, & Boyes, 2006; Gonzaga & Haselton, 2008; Griskevicius et al., 2007; Griskevicius, Cialdini, & Kenrick, 2006; Hill & Reeve, 2004; Kenrick et al., 1990; Kenrick, Griskevicius, Neuberg, & Schaller, 2010; Li et al., 2002; Maner, Gailliot, Rouby, & Miller, 2007). Consideration of such costs and benefits suggests that although women may be more associated with and interested in love and commitment, it should actually be men who are more likely to express such feelings first. This prediction is derived from several principles in economics and evolutionary biology.

Parental Investment and Sexual Selection

The first principle relevant to our prediction is *parental investment*. This principle states that because reproductive success is the primary driver of natural selection, the biological sex (in any species) that makes the greater minimum obligatory investment in conceiving viable offspring will tend to be more romantically choosy than the other sex (Trivers, 1972). In most species, including humans, females expend more resources than males do on pregnancy and the rearing of offspring. Therefore, women are usually more selective than men regarding what

qualities are acceptable in a potential mate (Buss & Schmitt, 1993; Geary, 1998; Kenrick, Groth, Trost, & Sadalla, 1993; Li et al., 2002; Regan, 1998; Schmitt, Shackelford, & Buss, 2001).

Indeed, the qualities that women tend to be most selective about consist of the qualities that will help to ensure the fitness of women and their children, such as material resources and signals of relationship commitment and provisioning (Li et al., 2002).

Building on these ideas, the discrepancy in romantic choosiness between the sexes raises the second relevant principle from evolutionary biology, *sexual selection* (Darwin, 1871). Sexual selection is an evolutionary process that can produce sex differences over time because the choosier sex in a given species—the sex with higher obligatory parental investment—preferentially selects mates with particular traits and behaviors, which then become more widespread in the population of that sex. Many sex differences in humans can be explained at least in part through sexual selection. For example, men, as the relatively less choosy sex, tend to use more display tactics (e.g., from flaunting resources and physical acumen to direct combat) in order to attract mates (Buss, 1988; Daly & Wilson, 1988; Griskevicius et al., 2009; Griskevicius et al., 2007; Miller, 2000; Zahavi & Zahavi, 1997). As women have more to lose than men by making poor mating choices, women have a relatively stronger motivation to choose carefully and wisely, whereas men have a relatively stronger motivation to be chosen (Ackerman & Kenrick, 2009). Thus, these parental investment and sexual selection pressures suggest that one important reason why men may confess love earlier than women is because men have a stronger desire to motivate early sexual activity in relationships.

Social Exchange Theory and Error Management Theory

The pressure on women to choose wisely creates a strong focus on the costs and benefits of potential romantic partners. The deliberations and trade-offs involving these costs and benefits

can be understood by considering that sexual access is a female-controlled resource (Baumeister & Vohs, 2004) in light of both the previously mentioned evolutionary theories and *social exchange theory* (Sedikides, Oliver, & Campbell, 1994; Sprecher, 1998; see also Clark & Mills, 1979; Fiske, 1992). From this economically-oriented perspective, men and women exchange sexual, physiological, and economic resources in the mating market (Baumeister & Vohs, 2004). Yet, whereas both sexes offer sexual access, only women offer costly physiological ones (e.g., gestation, lactation). Men, on the other hand, tend to be relatively stronger contributors of economic resources. A key difference, however, is that women's physiological resources are necessarily bundled with sexual access, whereas men's economic resources are not. This asymmetry results in female sexual resources being more valuable to men than male sexual resources are to women (Kenrick et al., 1993). As such, in romantic relationships women tend to “sell” and men tend to “buy” sexual access (Baumeister & Vohs, 2004). [Of course, we are not referring to prostitution or the exchange of money here, but simply drawing analogues between the roles that women and men often play and market behavior, much like how romantic relationship interactions can also be framed as negotiations.] As an example of bidding for sexual access, men might profess their interest—in the form of love confessions—in being a long-term exchange partner. Therefore, from an evolutionary-economic perspective, one function of a love confession is to announce a willingness to form a long-term, romantic joint venture.

An evolutionary-economics perspective suggests that the economy of romantic relationships revolves around sexual, parenting, and commitment concerns. Empirical findings have tended to support this perspective (e.g., Ackerman, Kenrick, & Schaller, 2007; Ackerman & Kenrick, 2009; Belk & Coon, 1993; Griskevicius et al., 2006; Kenrick et al., 1990; Kenrick et al., 1993; Li et al., 2002; Pawlowski & Dunbar, 1999; Regan, 1998; Saad & Gill, 2003; Schmitt

& Buss, 1996). For example, because one can never be absolutely certain about the feelings or actions of a potential romantic partner, and thus some risk in romantic decision making is inevitable, people exhibit biases to minimize the costs of making a wrong reproductive decision. The evolution of such biases is described by *error management theory* (Haselton & Buss, 2000; Haselton & Nettle, 2006). In their studies, Haselton and Buss (2000) found evidence for a male sexual overperception bias (i.e., men infer more sexual intent in women than is actually present) and a female commitment-skepticism bias (i.e., women infer less commitment intent in men than is actually present). These biases are consistent with the idea that women want to minimize selling errors (selling too low) and men want to minimize buying errors (not bidding high enough) in the romantic marketplace. In the present context, a relatively more costly error for men may be to avoid expressing commitment and risk losing the relationship. For women, a relatively more costly error may be to impulsively trust that expression and risk the consequences of a sexual relationship without male investment.

Current Research

An evolutionary-economics perspective specifies the following predictions about romantic communications. Because committed, long-term relationships often involve sexual activity, confessions of love may be used to achieve sexual access by (truthfully or insincerely) announcing long-term romantic interest. The costs and benefits associated with sexual activity suggest that men will be relatively more interested in seeking this access at the outset of a given relationship. Thus, although women may be stereotypically more associated with the concept and feeling of love (Fabes & Martin, 1991; Gonzalez & Koestner, 2006; Pines, 1998), it should be men who typically confess love first in relationships. Our perspective also speaks to the manner in which people react to confessions of love. That is, do recipients tend to react positively or

negatively to indicators of romantic commitment? And do these reactions depend on whether the recipient is a man or a woman? As we will discuss later, our perspective points to two key variables—the timing of a love confession and a recipient’s mating strategy—that should have a critical influence on how men and women react to a confession of love.

To examine these hypotheses, we conducted six studies addressing two inter-related research questions: (1) Who initially says “I love you” in romantic relationships, men or women? This question was addressed in Studies 1-3 by first examining people’s beliefs about who they think is the first to confess love, and then examining what actually happens in relationships. Building on these three studies, we then addressed the second related question: (2) How do men and women react to confessions of love? As we will discuss in detail later, this question was addressed in Studies 4-6 by examining men’s and women’s reactions to expressions of commitment depending on the timing of the love confession and depending on the mating strategy that an individual is pursuing.

Who Is the First to Say “I Love You”?

Study 1: Beliefs

Method. Participants were passersby on a street corner near a northeastern U.S. university campus and thus comprised a mixed undergraduate/community sample. They included 25 women and 20 men (mean age = 28).¹ Participants agreed to take part in a study on general perceptions about romantic relationships and received a short paper questionnaire. Two binary choice items assessed beliefs about whether men or women are more interested in early romantic commitment: (1) “Who normally says they are in love *first* in romantic relationships?”, and (2) “In a new relationship, who thinks about getting serious first?” Participants also responded to two items using the following scenario: “Imagine you happen to overhear a couple talking. The

man [woman] says that he loves the woman [man]. It is the first time he [she] has ever said it. How long has this relationship likely been going on?” The second item reversed the target sex roles (order of these items was counterbalanced). Finally, participants were asked who they believe typically responds more positively to love confessions, men or women. Candy and juice drinks were given as compensation for participation.

Results. The first two binary choice items were analyzed using Chi-square tests (logistic regression analyses indicated no effect of participant sex). When asked “Who normally says they are in love *first* in romantic relationships?”, women were chosen 64.4% of the time (see Figure 1, panel A), $\chi^2(1) = 3.76, p=.05, \phi = .04$. Corroborating this finding, when asked “In a new relationship, who thinks about getting serious first?”, women were chosen 84.4% of the time, $\chi^2(1) = 21.36, p<.001, \phi = .10$. Thus, people generally believe that women are the first to confess love and are the first to think about transitioning to a committed relationship.

 Figure 1 about here

For the two scenario-based items, a mixed 2 (Participant Sex; between-subjects) X 2 (Target Sex; within-subjects) analysis of variance revealed only a main effect of Target Sex, $F(1, 43) = 13.50, p=.001$, Cohen’s $d = .39$. People believed that women ($M = 54.7$ days) tend to confess love an average of 23 days earlier in relationships than men do ($M = 77.8$ days). Thus, consistent with stereotypic associations of women and love, both men and women appear to believe that women are more likely to be the first to confess love in relationships.

Study 2: Recalled Reality

The previous study indicated that people generally believe women are more likely to both feel and express love first in romantic relationships. Study 2 explored the validity of this belief by asking people to recall who actually confessed love first in their romantic relationships.

Method. Participants included 45 female and 66 male undergraduates (mean age = 21) from a university in the northeastern U.S.² Upon arrival to the lab, participants received a short paper questionnaire assessing actual past experiences. Because responses in this study could only be valid if they came from people who had been in a romantic relationship in which love was confessed, participants initially were asked whether they had experienced such a relationship. Participants were then asked: (1) “Think about your last or current romantic relationship in which someone confessed their love. In this relationship, who admitted love first?” (response options included “me,” “my partner,” and “N/A”), and (2) “Think about the last time you said you were in love in a relationship. How long into that relationship did you begin thinking about saying you were in love?” (open-ended responses in days). All participants received course credit as compensation.

Results. 86.5% of participants had been involved in a past romantic relationship in which love was confessed. As predicted, of these participants, 61.5% reported that the man had confessed love first, $\chi^2(1) = 5.04, p < .03, \phi = .02$ (see Figure 1, panel B). A main effect of Participant Sex also indicated that women were more likely to report that men confessed first than men were, $\chi^2(1) = 11.22, p = .001, \phi = .03$. Responses to the item assessing first thoughts about confession were consistent with the idea that men are more rapid confessors. Although in Study 1 women were overwhelmingly perceived as thinking about commitment first, here, a

oneway ANOVA revealed that men ($M = 97.3$ days) reported thinking about confessing love about 42 days earlier than did women ($M = 138.9$ days), $F(1, 82) = 4.07, p < .05, d = .45$.

Study 3: Current Reality

Although people generally believe that women are more associated with feelings of romantic love and thus confess love first, participants in Study 2 reported that it was typically men who both confessed and planned to confess earlier. However, the particular relationships recalled in Study 2 (past or present) were not controlled. It may be that men and women differentially recalled relationships in which they confessed (or not), and it may also be that memory for confessions is itself biased. Study 3 was designed to address these issues by collecting reports from *both* partners in current romantic couples, from which we can assess the validity of individual memory.

Method.

Participants. Participants included 47 heterosexual couples (94 total individuals) drawn from an online community sample (mean age = 33, with a range of 18-69). This sample was taken from a pool maintained by a northeastern university, though the actual location of participants ranged throughout the U.S. Out of these 47 couples, several (7) disagreed about who confessed love first in their relationship. There were no systematic biases for gender among those couples that disagreed. All participants were involved in long-term, committed relationships, lasting from 14 to 376 months (mean = 84 months).

Procedure. Participants were informed that they were required to currently be in a romantic relationship in which “I love you” had been said at least once by at least one partner, and that current romantic partners would be recruited to complete the study as well. Upon agreeing, participants were directed to an online survey featuring relationship questions,

including who confessed love first in the relationship. At the conclusion, partner email addresses were collected and partners were contacted. We collected demographic information from each partner to ensure couple validity. Once each member of a couple completed the study, each participant was mailed \$10.

Results. Couples who did not agree on first confessor sex were removed from the analysis. Consistent with previous findings, 70.0% of couples agreed that men ($N = 28$) confessed love first in the relationship compared to women, $\chi^2(1) = 6.40, p = .01, \phi = .16$ (see Figure 1, panel C). Length of relationship did not affect this outcome. This percentage is higher than was found for recalled confession experiences, suggesting that people (primarily men, given the participant distribution of Study 2) may commonly underestimate the extent to which men say “I love you” first in relationships.

Discussion. In Studies 1, 2 and 3, we examined whether men or women are more likely to say “I love you” first in romantic relationships. Findings from the first study showed that people *believed* that women would be the first to confess love and the first to think about becoming romantically committed, consistent with the stereotypic association between women and feelings of love (e.g., Fabes & Martin, 1991; Gonzalez & Koestner, 2006; Pines, 1998). However, the next two studies revealed that in both their current and previous relationships, it was men who were more likely to be the first confessors (see Figure 1). With respect to the timing of confessions, people *believed* that it takes men an average of three weeks longer than women to confess love. However, when asked when they had first considered admitting love in their relationships, men reported thinking about it six weeks earlier than did women. These findings support the first set of predictions derived from an evolutionary-economics perspective on romantic communication.

Thus, although people generally believe that women are more associated with love and initial relationship commitment, it is in fact men who are more likely to express love and commitment first in romantic relationships. Stereotypic beliefs can lead to inaccurate impressions about early commitment behaviors. However, it is possible that the fitness pressures people faced over evolutionary time may lead men to generally act quickly, while leading women to delay confessing love. That is, early expressions of commitment may help men to promote sexual activity in relationships, whereas later expressions may help women to avoid the potential costs of choosing a partner without adequately evaluating him.

Of course, the choice to confess or wait for a confession is not the only action that evolutionary-economic pressures may bias. The thoughts and emotions people experience after being told “I love you” may be colored by whether that confession minimizes or exacerbates recipients’ potential fitness costs. Our second question in the current research concerns these reactions. That is, do recipients tend to react positively or negatively to indicators of romantic commitment? Do these reactions depend on whether the recipient is a man or a woman? We expected that, just as parental investment and sexual selection pressures may differentially alter people’s willingness to express commitment, these same pressures should lead to differential reactions to such expressions. Our next three studies investigated this possibility.

Is Being Told “I Love You” a Good Thing?

In Studies 4-6, we investigated people’s affective reactions to expressions of commitment in romantic relationships. According to the *beliefs* people hold, we might expect that stereotypic associations between women and feelings of love would lead women to feel more positively when receiving a confession of love. This possibility is also consistent with women’s relatively stronger interest in long-term romantic relationships (Peplau, 2003; Simpson & Gangestad,

1992). If love confessions signal an interest in romantic commitment, they may appeal relatively more to women than to men. In fact, in the relationship survey we conducted for Study 1, we asked participants whether they believed that women or men typically respond more positively to love confessions. Not surprisingly, women were chosen 88.6% of the time.

An evolutionary-economics perspective, however, predicts a different and more precise pattern of results. From this perspective, reactions to love confessions should critically depend on the actual exchange of sexual and parental investment resources. Thus, the timing of this exchange—whether the exchange of sexual and parental investment resources occurs *before or after* the expression of commitment—should influence both women's and men's reactions. Note that this timing is no longer relative to the beginning of the relationship (as in the previous studies) but relative to the occurrence of first sexual intercourse. Before sexual activity in a relationship, the highest parental investment costs involve women consenting too early and men missing out on a possible opportunity (Haselton & Buss, 2000). Women, like anyone who offers a costly resource on credit, should be wary about displays of insincere interest. If love confessions are bids for sexual access, then women should respond *less positively* than men to confessions that occur *prior* to the onset of sexual activity in a relationship. Men, in contrast, should respond *more positively* to confessions that occur *prior* to the onset of sexual activity, as such pre-sex confessions might indicate that women are more willing to grant sexual access.

After sex has occurred, women have incurred the initial costs of possible pregnancy and, on average, have much more to gain by maintaining the relationship. In relationships in which sex occurs before love is confessed, women have effectively extended credit without collateral (i.e., sex becomes a sunk cost) and thus they should be motivated to seek investment, potentially in the form of commitment. Women should therefore feel *more positive* about receiving a *post-*

sex than a pre-sex confession of love. Men's confessions, in fact, are likely to be more sincere (i.e., less colored by the goal of attaining initial sexual access) after sex has occurred. Yet, a man may potentially feel *less positive* about receiving a *post-sex* confession if the long-term implications of the confession conflict with that man's investment horizon. All else equal, if men have already received the benefits of sexual access bundled with potential female offspring care, those men may have (from an evolutionary perspective) relatively less to gain from continuing to maintain the relationship than women do.

As is the case with other instantiations of evolved biases (e.g., Haselton & Nettle, 2006), differential reactions are likely to emerge in both emotional and cognitive forms. For instance, recipients of love confessions may *feel* better or worse depending on their gender and the timing of the confession, but they may also *evaluate* confessions and confessors differently depending on these same factors. We tested these ideas in the following studies.

Study 4: Love, In Theory

In Study 4, we examined men's and women's levels of happiness from being told "I love you" in a hypothetical romantic relationship. Although both men and women are likely to be relatively happy to receive such an admission, we predicted that men should react more positively before sex had occurred, whereas women should react more positively after sex had occurred. Additionally, we assessed evaluations about the acceptable timing of love confessions. Positive emotional reactions to early-relationship confessions may be accompanied by the belief that early confessions are romantically appropriate. Following from the parental investment costs and error management biases described above, we expected that men would judge earlier confessions to be more appropriate than would women.

Method.

Participants. Participants included 84 female and 35 male undergraduates from a southwestern U.S. university (mean age = 21). All procedures took place on paper questionnaires, and participants received course credit as compensation. Participants completed the study in groups of 1-3.

Procedure. This study used a 2 (Participant Sex) X 2 (Confession Timing: pre-sex, post-sex) between-subjects design. Participants received a paper questionnaire that included two sections. The first section presented a scenario asking participants to imagine they were beginning a new romantic relationship with someone they found “attractive and interesting.” The scenario explained that the couple had started dating and detailed many common behaviors that the couple had engaged in (e.g., spending time with each other, eating together, meeting friends, etc.). One of these details constituted the experimental manipulation—whether or not sexual intimacy had occurred in the relationship thus far. Half of the participants read that they had already been sexually intimate in the budding relationship, whereas the other half read that they had not yet been sexually intimate. This detail was included in the bigger list of details with no special attention drawn to it and thus acted as a subtle cue to the onset of sexual activity. At the end of the scenario, all participants read that, one month into the relationship, their partner made the first deep statement about romantic feelings by saying “I love you.” Participants then indicated how much happiness they felt after hearing “I love you” from their romantic partner on a scale from 0 = “not at all” to 7 = “very much.”

The next item after the sex/no-sex scenario assessed judgments about how long into a relationship it becomes acceptable to say “I love you.” Participants were asked again to imagine that a dating partner had recently confessed love. Participants then responded to one item asking:

“When does it generally become *acceptable* to admit love in a new romantic relationship?” [1 = “first day,” 2 = “two to three days,” 3 = “one week,” 4 = “two to three weeks,” 5 = “one month,” 6 = “two to three months,” 7 = “six months,” 8 = “one year,” 9 = “two or more years”].

Finally, given that participants who are already in committed romantic relationships may feel less happiness when imagining someone else express their love, we measured current romantic relationship status to control for potential differences between single participants and participants currently in committed relationships (exclusion of this variable did not change the results reported below).

Results.

Happiness. As expected, participants in all conditions evidenced at least a moderate level of happiness after being told “I love you” (the minimum average score was 4.0 on a 0-7 scale). Happiness scores were entered into a 2 (Participant Sex) X 2 (Confession Timing: pre-sex, post-sex) analysis of covariance (controlling for relationship status). Consistent with predictions, a significant Participant Sex X Timing interaction emerged (see Figure 2, panel A), $F(1, 114) = 6.50, p=.01, \eta_p^2 = .05$. Contrast analyses revealed that men’s positive feelings were significantly greater than women’s prior to sex, $F(1, 114) = 3.97, p<.05, d = .54$, whereas this pattern was (marginally) reversed after sex ($p = .097$). This reversal was driven primarily by an increase in women’s happiness after sex, $F(1, 114) = 11.50, p=.001, d = .57$, though men did exhibit a (non-significant) drop in happiness. Finally, a marginal effect of relationship status indicated that single people felt somewhat more happiness than committed people upon imagining hearing “I love you,” $F(1, 114) = 2.92, p=.09$.

 Figure 2 about here

Acceptability judgments. How is the understanding of romantic commitment displays influenced by the onset of sexual activity in relationships? To assess whether this understanding was biased by the timing manipulation, we asked participants to report when it first becomes acceptable to admit one’s feelings of love (2 women and 2 men did not complete this item and were dropped from the analysis). A 2 (Participant sex) X 2 (Confession Timing) univariate analysis of covariance revealed a main effect of Timing, $F(1,110) = 8.33, p<.01, d = .44$, that was qualified by a Participant Sex X Timing interaction, $F(1, 110) = 8.70, p<.01, \eta_p^2 = .07$ (there was

no effect of relationship status). After imagining a romantic scenario in which they have not yet had sex, men considered love confessions to be acceptable much earlier than did women (men: $M = 5.18$, $SD = 2.20$; women: $M = 6.46$, $SD = .82$), but this difference disappeared for individuals who imagined already having had sex (men: $M = 6.82$, $SD = .87$; women: $M = 6.45$, $SD = 1.06$). This pattern mimics the previous happiness findings, indicating that in addition to emotional fluctuations, basic judgments about the course of relationships are influenced by the timing of love confessions. Contrast analyses indicated that the pre-sex difference between men and women was significant, $F(1, 110) = 13.10$, $p < .001$, $d = 1.00$, and that the post-sex change was due entirely to men reporting that later confessions were now more appropriate, $F(1, 110) = 11.63$, $p = .001$, $d = .29$. Thus, as suggested by the happiness reactions, men find early confessions more appealing than women do, but only prior to the occurrence of sex in relationships.

Study 5: Love, Actually

The previous study investigated reactions to love confessions in hypothetical relationships. Study 5 allowed us to confirm the validity of these reactions within the context of true, current relationships. We also improved reliability by assessing a broader set of positive emotions. Additionally, participants evaluated the intentions of their partners after being told “I love you.” We expected that emotional responses would be similar to those in Study 4, and that judgments of the honesty of confessors would mimic judgments of confession acceptability from the previous study (with men perceiving more honesty prior to sex than women, but not after sex).

Method.

Participants. Participants were recruited from a community population using ads in multiple cities on the website Craigslist.com. All participants were required to have recently

received a love confession. Specifically, participants had been told “I love you” for the *first time* in that relationship within the past 2 weeks. This stringent criterion was used to minimize recall biases on prior emotional experiences. Actual time since confession ranged from 30 minutes to 10 days (mean = 3.6 days).³ The sample included 44 women and 29 men currently in relationships (mean age = 28, with a range from 18-57). Participants were compensated by being entered into a drawing for a \$50 gift card.

Procedure. Upon agreeing to participate, individuals were directed to an online questionnaire. The questionnaire included several types of items, including (1) emotional reactions to a love confession, (2) perceptions of confessor honesty, and (3) demographics (including whether the confession occurred prior to or after sexual intercourse in the relationship). For the emotional items, participants rated on a 1 (“not at all”) to 8 (“very much”) scale the degree to which they experienced the following emotions following their partner’s confession: happiness, romantic love, joy, contentment, pleasure and enthusiasm. For the confessor honesty items, participants were asked two questions using the same 1-8 scale: “How sincere did you think this confession of love was?” and “How trustworthy is the person who made this confession?” Finally, all participants were debriefed.

Results.

Positive emotion. A maximum likelihood factor analysis on the emotion items revealed that all items loaded on a single factor that explained 62.8% of the variance (other eigenvalues < 1). Loadings were all greater than .56. These items were averaged to create a positive emotion composite ($\alpha = .88$). A Participant Sex X Confession Timing ANOVA on this composite revealed only an interaction of Sex and Timing (see Figure 2, panel B), $F(1, 69) = 3.87, p = .05, \eta_p^2 = .05$. Prior to sex in the relationship, men felt more positively from being told “I love you”

than did women, $F(1, 69) = 5.07, p < .05, d = .68$, but this was not the case after sex had occurred, $p > .56$. This change was due to women feeling more positive emotion after sex than before, $F(1, 69) = 3.77, p < .06, d = .65$. As in Study 4, men exhibited a non-significant drop in happiness after sex compared to before.

Perceived honesty. The sincerity and trustworthiness items were averaged to create a composite of perceived confessor honesty ($\alpha = .71$). A Participant Sex X Confession Timing ANOVA on this composite revealed only a significant interaction (see Figure 3), $F(1, 69) = 9.34, p < .01, \eta_p^2 = .12$. Prior to sex in the relationship, women judged their romantic partner's confession to be less honest than did men, $F(1, 69) = 11.51, p = .001, d = 1.23$. This was not the case after sex had occurred, $p > .32$. The change was due both to women perceiving *more* honesty in their partners after sex ($M = 7.33, SD = .82$) than before sex, $F(1, 69) = 4.84, p < .05, d = .62$, and to men perceiving *less* honesty in their partners after sex ($M = 7.04, SD = .91$) than before sex, $F(1, 69) = 4.62, p < .05, d = .92$. Thus, women feel relatively worse and are more suspicious when receiving a confession of love prior to the onset of sexual activity in a relationship, though this is not the case once sex has occurred.

Figure 3 about here

Discussion. Studies 4 and 5 examined how positively men and women feel when they are told “I love you.” We predicted that happiness would differ depending on whether the confession occurred before or after the couple began sexual relations in the relationship. Supporting our predictions, when people were told “I love you” *prior* to the occurrence of sexual intercourse, men felt more positively than women did. But *after* the occurrence of sexual intercourse, this

was not the case. Instead, women felt as happy, or slightly happier, than men (see Figure 2). Further analyses showed that this difference resulted primarily from women reporting more happiness after the onset of sexual activity. Complementing these emotional changes, people's judgments about the appropriateness of early love confessions and their perceived honesty of the confessor also varied depending on the occurrence of sexual intercourse (see Figure 3). *Prior* to sex, men felt that confessions were acceptable sooner in the course of a relationship and that their romantic partners' confessions were more honest than did women. *After* sex, men judged later confessions to be more acceptable, and they perceived less honesty in their romantic partners.

While these patterns are inconsistent with the belief-based prediction that women should generally be happier than men to receive confessions, the findings are consistent with an evolutionary-economics perspective. That is, because sexual activity is necessarily associated with the high costs of female parental care, women likely possess adaptive biases to be cautious of initializing sexual relations (Haselton & Buss, 2000). The depressed positive emotion exhibited prior to sexual activity may indicate one such bias, and suggests that women might interpret men's early confessions as signals of sexual interest. However, once a woman engages in a sexual relationship, she incurs the costs of potential obligatory parental care, and thus there is little additional cost to treating a confession as a true signal of commitment. Increases in positive emotion at this point may even reflect behaviors designed to preserve the relationship.

Men, on the other hand, incur greater parental investment costs from missing potential reproductive opportunities (Haselton & Buss, 2000). The relatively higher levels of pre-sex positivity men exhibited suggest that men may be interpreting "I love you" as, at least in part, a signal of sexual opportunity. Thus, prior to sex in a relationship, men are happier to receive love

confessions. After sex, men's emotional responses are relatively similar, although they now feel that later confessions are more appropriate and they show more mistrust in their partner's confessions.

Study 6: Love, Strategically

The findings from our previous studies consistently demonstrate that men feel happier than women when hearing "I love you" before sex in a relationship, but the findings are less clear for men after sex had occurred. In Studies 4 and 5, men who imagined or recalled receiving a love confession after sex felt somewhat *less* positive than men who imagined or recalled confessions prior to sex. It is possible that this pattern reflects real variation in strategic responses to love. That is, "happiness" might mean very different things to different people. Drawing on an evolutionary-economics perspective, we propose that a particular chronic mating strategy often associated with, but not exclusive to, men may drive responses to and judgments of love confessions as a function of whether sex has occurred or not. By directly measuring this mating orientation, we can potentially shed light on the mechanism underlying our earlier findings.

Although men and women are differentially influenced by parental investment pressures, there remains a great deal of within-sex variation with respect to people's interest in romantic commitment (Buss & Schmitt, 1993; Gangestad & Simpson, 2000). Study 6 was designed to investigate the role of a particularly relevant individual difference that indexes different kinds of mating strategies—sociosexual orientation. An *unrestricted* sociosexual orientation reflects short-term mating interests, meaning that a person is interested primarily in novel sexual relationships and is willing to engage in sexual intercourse without strong prior feelings of closeness and commitment; in contrast, a *restricted* orientation reflects an interest in long-term

relationships in which closeness and commitment are prerequisites for sex (Simpson & Gangestad, 1991, 1992). Restricted and unrestricted sociosexual orientations can be viewed as representing two different types of mating strategies (along a continuum): a long-term strategy and a short-term strategy.

Given that each type of mating strategy is associated with different romantic goals (i.e., sex vs. committed relationship), individuals with different orientations should likewise have different reactions to hearing “I love you” from their romantic partners. Consider the findings from Studies 4 and 5: Although men generally felt more positive than women when hearing a confession prior to sex, it may not be that *all* men feel especially positive in this situation. Specifically, men who are interested in short-term romance should be most happy about pre-sex confessions of love because these men might be likely to perceive such confessions as signals of sexual opportunity. Such unrestricted, short-term oriented men should also be the ones to feel *less* happiness about *post-sex* confessions, as these confessions are no longer attached to the possibility of initial sexual activity. In contrast, men with more restricted, longer-term orientations should feel quite positive about post-sex confessions, as these men would be most interested in the elevated potential for a long-term romantic relationship. The same long-term focused men, however, may exhibit relatively *less* positivity prior to sex because these restricted men are liable to place relatively little weight on early sexual access.

We expected the pattern of results for women to be somewhat mitigated. One possibility consistent with our perspective, in fact, is that unrestricted women would show less overall interest in receiving a love confession. Because of the inherent sex differences in parental investment costs, women are more easily able to acquire sexual resources from men than men are from women. Whereas unrestricted men may react positively to signals of commitment in order

to motivate and obtain sexual access, unrestricted women need not react this way in order to obtain the same ends. Thus, we did not predict elevated pre-sex happiness in unrestricted women. In comparison, restricted women should likely show responses similar to or stronger than those of restricted men. For these women, the potential costs of readily accepting pre-sex confessions are quite high, both for their proximal (relationship commitment) and ultimate (parental investment) goals. In sum, the first goal of Study 6 was to examine if people who have different chronic mating strategies (i.e., a restricted vs. unrestricted sociosexual orientation) might also have different reactions to confessions of love.

The second goal of Study 6 was to extend these ideas by investigating whether the happiness or positivity that people feel after being told “I love you” has a different meaning depending on whether recipients are interested in long- or short-term relationships. For example, unrestricted, short-term oriented recipients may feel happy *because of* increases in feelings of sexual excitement. These feelings of sexual excitement would conform to unrestricted individuals’ preferred short-term romantic strategy. In contrast, the preferred romantic strategy of restricted, long-term oriented recipients may lead them to feel happiness *because of* increases in romantic love following love confessions. Thus, Study 6 was also intended to examine whether people’s reported feelings of “happiness” could be masking a more textured and precise pattern of reactions consistent with an evolutionary-economics perspective.

The third and final goal of Study 6 was to directly examine perceptions of early confessions of love. That is, what attributions do people make about the intended meaning of these confessions? We expected that the expression “I love you” would be seen as promoting particular relationships outcomes (e.g., commitment, sex) and that men would be relatively more associated with the promotion of sexual activity. Thus, one reason women respond less

positively to early love confessions might be that they attribute an ulterior motive of sexual interest to these confessions.

Method.

Participants. Participants included 137 female and 94 male undergraduates from a southwestern U.S. university (mean age = 19). All procedures took place on individual computers, and participants received course credit as compensation.

Design and Materials. This study used a 2 (Participant Sex) X 2 (Confession Timing: pre-sex, post-sex) between-subjects design with Sociosexual Orientation as an individual-level predictor. The procedure mimicked that used in Study 4. Additionally, the current study also measured sociosexual orientation, feelings of sexual excitement, feelings of romantic love, and asked about possible reasons why a person would confess love in a relationship.

Following the hypothetical relationship scenario (see Study 4), three affective responses were measured: happiness, romantic love, and sexual excitement. Happiness allows for a replication of earlier findings, and the other states allow us to determine whether the construct “happiness” might incorporate distinct feeling states that map onto short- and long-term mating strategies.

Next, we investigated the questions: When a romantic partner confesses love relatively early in a relationship, what attributions are made about that confession? Do people perceive these confessions to reflect different intents (e.g., sexual interest, commitment) depending on whether those confessions are made by men or by women? These questions directly address the topic of recipient interpretation and allow us to determine whether people associate women’s and men’s confessions with different intentions. Participants were asked to interpret why a hypothetical romantic partner would profess love relatively early in the relationship. Given our

hypotheses, participants rated two possible reasons on 1-7 scales from 1 = “not at all” to 7 = “definitely”: (1) to promote commitment in the relationship, and (2) to promote sexual activity in the relationship.

Finally, participants completed the sociosexual orientation scale (SOI; Simpson & Gangestad, 1991; also see Jackson & Kirkpatrick, 2007). This scale is typically scored by creating a single bipolar composite score, with higher values indicating greater unrestrictedness, and thus less restrictedness. We also controlled for current relationship status in all analyses, though no effects of this variable emerged.

Results.

Happiness. We began by replicating the previous analysis of participant sex and confession timing on happiness. As in Studies 4 and 5, participants in all conditions evidenced substantial happiness after being told “I love you” (the minimum average score was 5.5 on a 0-7 scale). A Participant Sex X Confession Timing ANCOVA again revealed a significant interaction of Sex X Timing, $F(1, 226) = 9.54, p < .01, \eta_p^2 = .04$. Replicating our findings from earlier studies, the interaction indicated that men felt more happiness prior to the onset of sexual activity, and women felt more happiness after the onset of sexual activity.

Because the focus of the current study was to examine how sociosexual orientation (SOI) might moderate happiness reactions, we next conducted an analysis with the inclusion of SOI. We regressed happiness scores on the predictors Participant Sex, Confession Timing, centered SOI and Romantic Relationship Status.⁴ When an interaction with SOI was significant, we tested the simple effect of Participant Sex within each Timing condition for participants 1 SD above and 1 SD below the sociosexuality mean (Aiken & West, 1991). This method was also used for plotting the results.

Overall analyses revealed significant main effects of Participant Sex, $F(1, 222) = 5.67$, $p < .02$, $d = .32$, and Confession Timing, $F(1, 222) = 5.42$, $p = .02$, $d = .31$, which were qualified by the expected 3-way interaction of Sex, Timing and SOI (see Figure 4), $F(1, 222) = 4.67$, $p = .03$, $\eta_p^2 = .02$. As predicted, among unrestricted participants (1 SD above the mean), men again exhibited more happiness from being told “I love you” prior to sex than did women, $F(1, 84) = 4.93$, $p < .03$, $d = 1.2$, though this was not the case after sex had occurred, $p > .99$. Further, unrestricted men actually exhibited less happiness after sex compared to before sex, $F(1, 84) = 4.57$, $p < .04$, $d = .74$, though unrestricted women did not, $p = .50$. Restricted women and men (1 SD below the mean) were not significantly different from each other at either level of Timing, $ps > .38$. However, a simple main effect of Timing indicated that restricted people in general felt more happiness when receiving a confession of love after sex as compared to before sex, $F(1, 84) = 5.88$, $p < .02$, $d = .75$ (the simple-simple effects for women, $p = .07$, and men, $p = .08$, were both marginal). Thus, the overall pattern of affective reactions found in Studies 4 and 5 (see Figure 2) appears to be driven by unrestricted participants—unrestricted men felt more happiness prior to sex and less happiness afterwards. Restricted people simply felt happier after sex than before.

 Figure 4 about here

The meaning of happiness. Does reported happiness signify different things to different people? We conducted analyses on the romantic love and sexual excitement items to determine their role in the previous effects on happiness. We expected romantic love to be most relevant to restricted individuals (especially women), and sexual excitement to be most relevant to unrestricted individuals (especially men). Each item was entered as a covariate along with the

previous predictors in separate analyses on happiness. When sexual excitement was covaried, the earlier 3-way interaction of Sex, Timing and SOI was eliminated, $p = .75$. Indeed, directly investigating the effect of Timing on unrestricted participants, men no longer felt less happiness after sex than before, $p = .22$ (unrestricted women continued to exhibit no change, $p = .88$). This change from the previous analysis suggests that unrestricted men, perhaps more so than unrestricted women, incorporate sexual excitement within the happiness they feel from being told “I love you.”

Next, when romantic love was included in the overall analysis, the 3-way interaction of Sex, Timing and SOI remained significant, $F(1, 221) = 3.76, p = .05, \eta_p^2 = .02$. However, when directly investigating the effect of Timing on restricted participants, women no longer felt more happiness after sex than before sex, $p = .27$ (restricted men continued to feel more happiness, $F(1, 83) = 3.58, p = .06, d = 1.44$). This change from the previous analysis suggests that restricted women, more so than restricted men, incorporate romantic love within the happiness they feel from being told “I love you.”

Perceptions of early confessions. When a romantic partner confesses love relatively early in a relationship, what attributions are made about that confession? Participants were asked to interpret why a hypothetical romantic partner would confess love to them relatively early in the relationship. A multivariate analysis regressing the two attributions on Participant Sex, Confession Timing, SOI and Romantic Relationship Status revealed two main effects of Sex (see Figure 5). Men believed that women were relatively more interested in increasing the level of commitment in the relationship than in increasing sexual activity, $F(1, 222) = 4.05, p < .05, d = .38$, whereas women believed that men were relatively more interested in promoting sexual activity in the relationship than in promoting commitment, $F(1, 222) = 9.06, p < .01, d = .61$. This

latter Sex effect was also qualified by an interaction with SOI, $F(1, 222) = 4.03, p < .05, \eta_p^2 = .02$. Among restricted participants, women believed that men were more interested in sexual activity ($M = 5.11, SD = 1.31$) than men believed women were ($M = 3.56, SD = 1.88$), $F(1, 84) = 6.13, p < .02, d = .99$. However, among unrestricted participants, women's estimates of men ($M = 5.20, SD = 1.03$) and men's estimates of women ($M = 4.36, SD = 1.89$) were not significantly different, $p = .18$. These findings support the idea that women respond more negatively than men do to early confessions of love because these confessions are taken as signals of sexual interest.

 Figure 5 about here

Discussion. Study 6 supported the earlier finding that men respond more positively than women to a confession of love prior to sex in a relationship, and provided evidence for a mechanism underlying this effect. Greater happiness on the part of men prior to sex occurred solely within people highly interested in short-term romance (see Figure 4). In fact, these sociosexually unrestricted men exhibited significantly less happiness after sex had occurred in the relationship. Further, when sexual excitement was statistically controlled, men no longer showed decreases in post-sex happiness. These findings suggest that men interpret pre-sex confessions of love as signals of potential sexual activity. This interpretation may not be at the forefront of conscious awareness, however, as men were less likely to attribute communication of sexual interest to a woman's confession than communication of romantic commitment (see Figure 5). In contrast, women explicitly interpret men's love confessions as sexual signals. Whereas (unrestricted) men appear to include sexual excitement in their feelings of happiness, (restricted) women appear to include romantic love in their feelings of happiness. When romantic

love was statistically controlled, women no longer showed significant increases in post-sex happiness.

General Discussion

Who is more likely to confess love first in romantic relationships? If we were to rely on the traditional stereotype that men are from Mars and women are from Venus, we would expect that this act typically falls on the shoulders of women. Indeed, people's beliefs about the association between women and love support this idea. Consider an article on CNN.com explaining that "it often takes men longer to [feel love] than it does for women. Men process their emotions more slowly, they're usually more cautious about taking their feelings and relationships to the next level" (Atterberry, 2008). Supporting this notion, both men and women reported that it is women who both think about becoming serious in relationships sooner than men and confess love first—over three weeks earlier than men on average (see Study 1). Yet these beliefs may not reflect the romantic reality. When examining what actually happened in their past and current relationships (see Studies 2 and 3), it was men who were more likely to confess love first. This was not simply a function of women waiting for their partners to make the first move (Atterberry, 2008)—men first considered expressing their feelings six weeks before women did. These latter findings conform to predictions derived from error management theory (Haselton & Buss, 2000), which suggests that men will often take the initiative in promoting romantic relationships so that they do not incur the costs of missing a potential low-cost mating opportunity.

How can we reconcile the disjunction of people's beliefs with their experiences? To better understand this disjunction, our evolutionary-economics perspective pointed to an important transition point in romantic relationships: the onset of sexual activity. Our framework

suggested that men and women are likely to react differently to a love confession depending on whether it occurs before or after the onset of sexual activity. Consistent with predictions, prior to sex in a relationship, men were more likely than women to react positively when receiving a confession (of course, women's responses were not affectively negative, but simply less positive than men's; see Studies 4 and 5). On the face of it, this reaction appears to suggest that men are quite interested in early commitment. However, after the onset of sex in a relationship, men exhibited somewhat less positivity to confessions of love. This emotional slump, combined with a strong increase in women's happiness, may indicate that pre-sex and post-sex confessions of love afford unique implications. A pre-sex confession may signal interest in advancing a relationship to include sexual activity, whereas a post-sex confession may instead more accurately signal a desire for long-term commitment.

An evolutionary-economics perspective suggests that these two interpretations will be differentially valued by men and women. Men incur relatively fewer parental investment costs than women from promoting a serious romantic relationship that is accompanied by sexual activity (Trivers, 1972). Thus, men may feel especially positive about receiving a pre-sex expression of devotion, as this allows them to quickly "buy low"; women may feel more apprehensive about the particular timing of this expression because their relatively higher costs lead them to prefer taking their time to "sell high" (Baumeister & Vohs, 2004). These preferences, and the resulting affective reactions, would be facilitated by sex-specific cognitive biases that predispose women to under-perceive commitment in men, and men to over-perceive sexual interest in women (Haselton & Buss, 2000). We should also expect to observe reaction-consistent behaviors in men and women, such as the rapid encouraging of sexual activity by men

and increased surveillance of male commitment indicators and even the rejection of love confessions by women.

Further evidence for this sexual economics framework was found in Study 6. Varying reactions to confessions of love emerged only among those individuals motivated by the desire for short-term, sexual relationships. Sociosexually unrestricted men were especially happy to receive a confession prior to sex, but they showed significant decreases in happiness to a confession after sex. Once a sexually unrestricted man enters into a sexual relationship, he faces a high opportunity cost from maintaining that relationship. Decreases in positive affect may promote that relationship's dissolution. Indeed, controlling for sexual excitement eliminated unrestricted men's post-sex reduction in happiness. On the other hand, men (and women) less interested in short-term relationships face higher costs from not maintaining those relationships. Consistent with this idea, both men and women who were sociosexually restricted felt more positive from receiving a confession of love after the onset of sex in a romantic relationship. These differential patterns exhibited by sociosexually restricted and unrestricted individuals suggest that one's mating strategy (and the sexual goals associated with that strategy) is a key mechanism driving pre- and post-sex feelings to confessions of love.

Thus, the answer to the question "Why do people believe that women confess love first when men are actually more likely to be first?" appears to be that, although people understand that a confession of love may signal multiple intentions (see Study 6), when making general judgments, people discount the short-term sexual interpretation in favor of the more classic, long-term commitment interpretation. Everyday experience and media exposure tell us that love ought to be an emotion involving deep connection and commitment. These same sources also link women with images of love (e.g., hearts, weddings, etc.) and with emotional understanding

and expressiveness (Fabes & Martin, 1991; Pines, 1998). Therefore, it is understandable that people believe women are more open to love. When it comes to reporting on their own experiences, however, a select set of men do not follow this interpretation. Instead, they convey being “in love” as a means to becoming “a lover.”

Implications and future directions: Romantic relationships

The current findings complement existing research on romantic turning points. This literature has often focused on the value of expressions of love and commitment for relationship escalation and satisfaction. Such work supports the idea that women are typically more responsive to such expressions (e.g., Metts, 2004). Here, we have shown that the nature of those responses depends on both who is doing the expressing and when they are doing it. Future research might also consider *how* love and commitment are expressed. The current studies presumed direct, verbal communication of love, but with the advent of various forms of electronic communication (e.g., email, texting, social network websites), people may end messages with expressions of love (perhaps even before confessing it in person). Research on the medium of such communications may highlight modern influences on relationship turning points.

This perspective may also add to awareness about potential hotspots within romantic interactions. A differential willingness to express and respond positively to love sets the stage for misunderstandings and early-relationship discord between men and women. Such problems could be manifested emotionally, as well as through errors of judgment, potentially motivating eventual break-up. For example, people may develop the mistaken belief that romantic partners are more interested in either sex or commitment than they actually are (see Haselton & Buss, 2000). A man might perceive a woman’s confession of love as indicating a desire for sexual activity when in fact it is more indicative of a desire for commitment. Women might also see a

man's confession of love as indicating a desire for sexual activity, though of course when that man is highly interested in short-term relationships, this perception might actually be correct. This latter possibility suggests that the reported female commitment skepticism bias (Haselton & Buss, 2000) can be quite functional for young adults, and in fact may represent relatively accurate affective forecasting about post-sex relationships. It would be interesting for future research to explore whether women adjust their perceptions appropriately when love is admitted by men with an acknowledged *long-term* sociosexual orientation—those men who truly equate expressions of love with feelings of commitment.

The patterns of behavior and responses found here are likely to generalize to other indicators of romantic commitment beyond confessions of love. Expressions of commitment may include gifts, artistic works, instrumental and emotional help, and other indicators of long-term devotion (Ackerman & Kenrick, 2008; Huang & Yu, 2000; Miller, 2000; Saad & Gill, 2003, Shackelford, Goetz, Buss, Euler, & Hoier, 2005). For example, Buss (1989) has identified a number of love acts that function to signal romantic suitability and to ensure reproductive success (e.g., telling secrets to each other, showing distress about brief separation). Belk and Coon (1993) found that romantic gifts are sometimes viewed in the context of economic exchange, and when this is true, men view giving such gifts as a means of obtaining sexual access whereas women view accepting such gifts as incurring a sexual obligation. Our findings suggest that these interpretations (and many common love acts) are more likely to be made prior to the commencement of sexual activity in romantic relationships. With respect to creative and artistic expression, it has been proposed that music, painting and dance may have their roots in the competition for mates that stems from sexual selection (Griskevicius et al., 2006; Miller, 2000). History is replete with examples of romantic songs and sonnets that, perhaps not

coincidentally, involve pledges and promises from men who long to be, but are not yet, romantically (sexually) connected with their beloveds.

Implications and future directions: Beyond romantic love

Part of the value of the evolutionary-economics perspective is that it can be applied to issues of commitment beyond those in the romantic realm. People establish numerous types of social relationships, and each of those relationships develops over time, often becoming more cohesive. Signals of commitment may facilitate this development, and these signals may be susceptible to biases analogous to the ones examined here. Consider how commitment might be displayed within the major domains of social life (Ackerman et al., in press; Kenrick et al., 2003, 2010): Affiliation, Status, Self-Protection, Mate Search, Mate Retention and Kin Care. Each of these domains involves a fundamentally distinct set of costs and benefits that is likely to bias commitment-based behavior (Ackerman & Kenrick, 2008). The current studies, and the ideas proposed above, are well-suited to issues of Mate Search (finding and attracting romantic partners) and Mate Retention (maintaining an established romantic relationship). We might also observe expressions of commitment relevant to Affiliation (forming and maintaining cooperative alliances) such as “Let’s be best friends forever,” to Status (gaining and maintaining prestige and power) such as “This is my dream job,” to Self-Protection (guarding oneself and valued others from threats) such as “I’ve always got your back,” to Kin Care (investing in and caring for genetic relatives) such as “You’re my favorite uncle.” Of course, one may also say “I love you” in each of these domains and mean something different each time. Critically, however, all of these confessions suggest commitment. As long as different potential costs and benefits are born from engaging in this commitment, we should expect to see low-cost/high-benefit parties expressing commitment early and often, and high-cost/low-benefit parties reacting more

negatively. A key task for future research might be to identify important transition points within each of these social domains at which the cost-benefit implications for interacting parties become reversed.

Although it is likely that the current research will generalize to other commitment indicators, including those described above, it is unlikely that other relationship transition points are as critical to sex differences in relationship commitment as the onset of sexual activity. In romantic domains, significant events such as cohabitation, meeting a partner's parents, marriage, and so on certainly denote that relationships have become more serious, and they are apt to influence the feelings felt within those relationships (e.g., Baxter & Bullis, 1986; Bullis et al., 1993; Gonzaga et al., 2006). In other domains where sex is not relevant, events such as signing a job contract, getting a promotion, becoming a team member and regularly visiting long-distance relatives may function similarly. However, sexual intercourse represents the core event for which parental investment pressures are relevant (because these pressures have acted on an evolved psychology, this remains generally true even in the age of birth control). Meeting a romantic partner's parents may feel like a big step in a relationship, but it plays a comparatively minor role in terms of the minimum obligatory costs a person must expend in fertilization and child rearing. This perspective would suggest that other transition points will be powerful predictors of commitment-recipient reactions to the extent that those points reflect stronger parental investment costs.

Conclusion

The words "I love you" represent the essence of romantic devotion. Feelings of love are typically accompanied by countless forms of actual and symbolic commitment, from gift-giving to sexual fidelity to "Until death do us part." However, admissions of love may also be motivated

by concerns arising from the evolutionary economics of romantic relationships. These economic pressures may often lead men to make the first move in confessing love, and women to react to such confessions with understandable suspicion. Perhaps by drawing attention to these behaviors, and their biological underpinnings, we may help people to understand the hidden meanings, motivations and mistakes associated with expressions of romantic commitment.

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Footnotes

¹ In all studies, as there were too few self-reported homosexual participants to achieve sufficient statistical power for separate analysis, all data refer to heterosexual participants.

² Across studies, all analyses used, or were checked by using, Type III Sums of Squares to produce conservative tests given any inequalities in cell sizes.

³ Only one participant found time to complete the study 30 minutes after being told “I love you” (all others, time since confession \geq 10 hours). Removing this participant from the data strengthens all reported effects.

⁴ Analyses were done using the multivariate GLM procedure in SPSS 15.0. Non-significant higher-order interactions were dropped from the models (see Maner et al., 2005).

Figure Captions

Figure 1. Common beliefs (Study 1; Panel A) compared with recalled (Study 2; Panel B) and current (Study 3; Panel C) relationship realities about *who* typically confesses love first in romantic relationships.

Figure 2. Emotional reactions to imagining (Study 4; Panel A) or recalling (Study 5; Panel B) being told “I love you” as a function of sexual activity in romantic relationships.

Figure 3. Perceptions of confessor honesty as a function of the timing of the love confession (Study 5).

Figure 4. Men’s and women’s feelings of happiness in response to being told “I love you” either before or after sexual activity had begun in the romantic relationship (Study 6). Panel A shows responses for participants low in sociosexuality (restricted) and Panel B shows responses for participants high in sociosexuality (unrestricted).

Figure 5. Attributions made about outcomes that confessions of romantic love are intended to advance (Study 6).

Figure 1

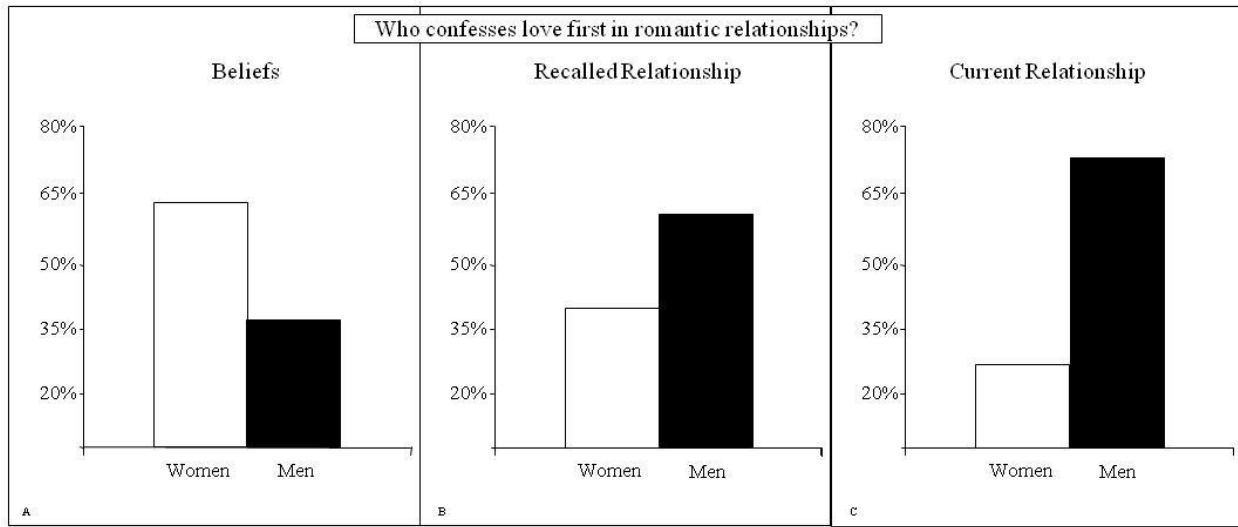


Figure 2

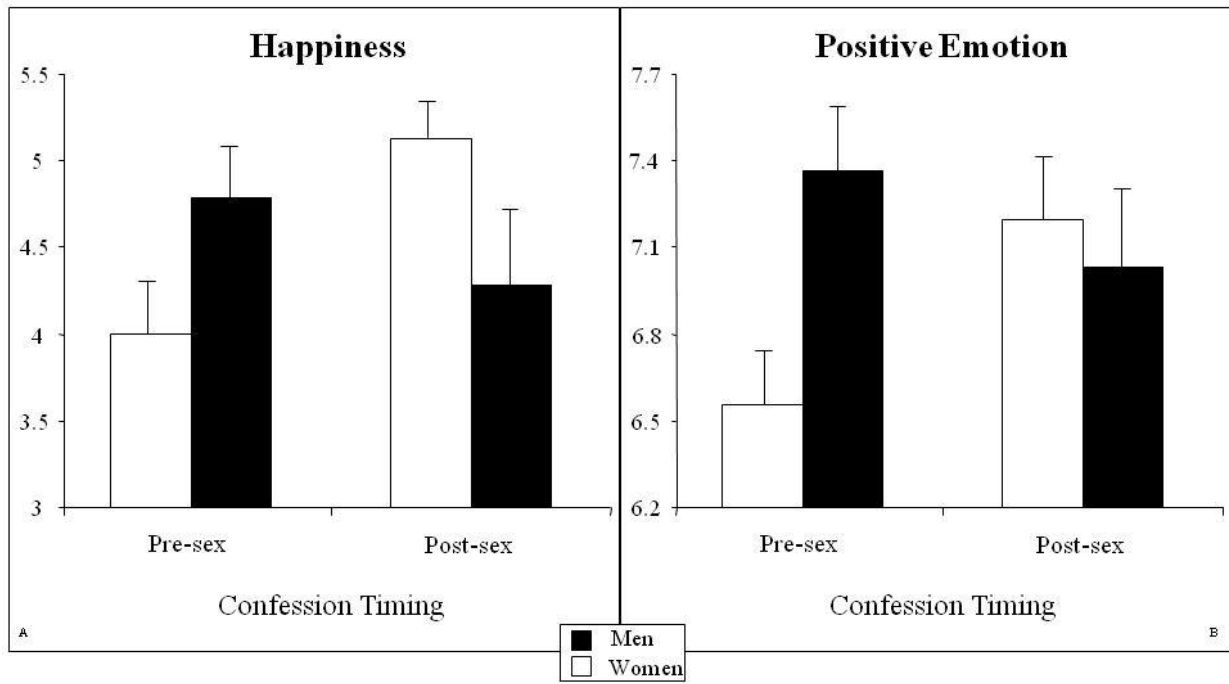


Figure 3

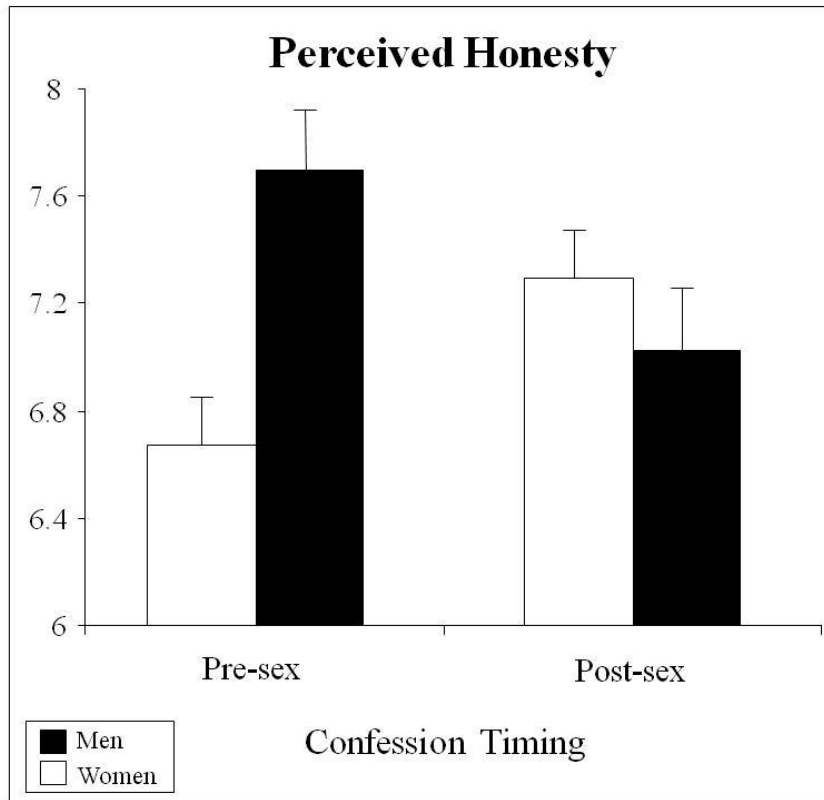


Figure 4

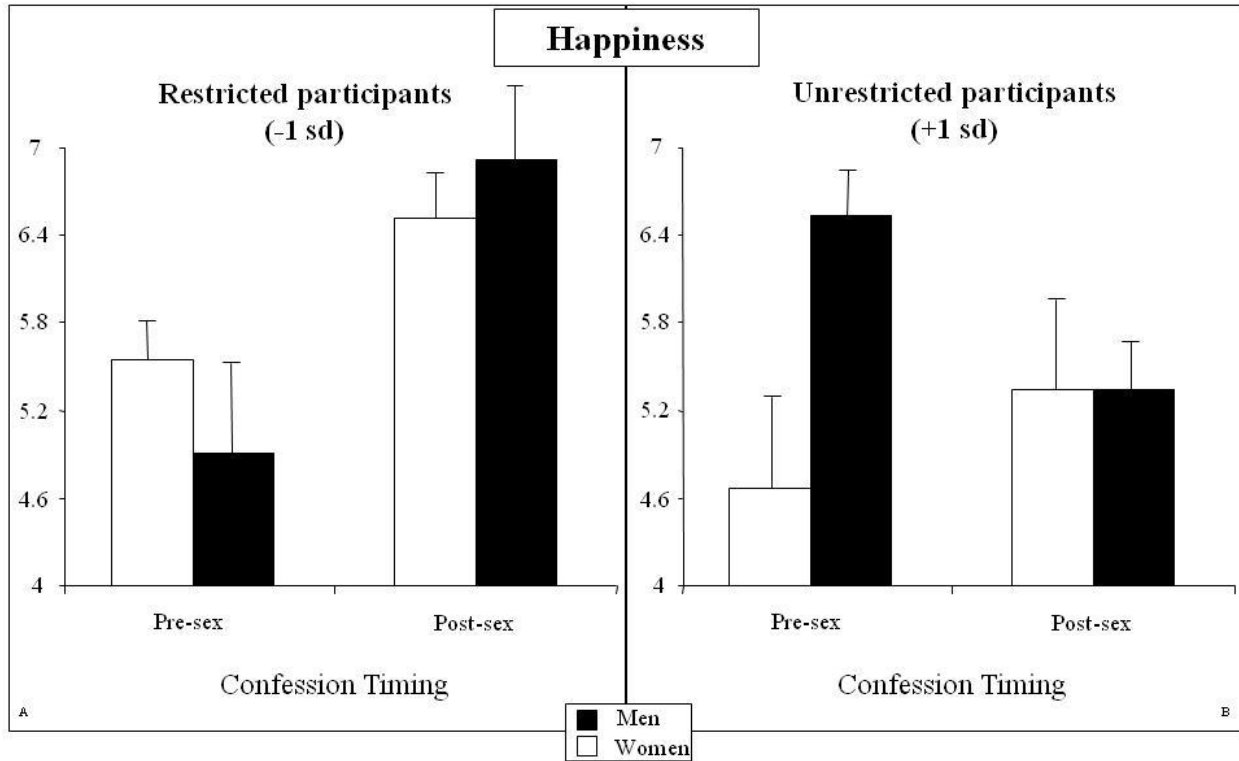


Figure 5

