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Learning in the absence of learning?: Biologically constrained sex differences in response to emotional and sexual intimacy

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LEARNING IN THE ABSENCE OF LEARNING? BIOLOGICALLY
CONSTRAINED SEX DIFFERENCES IN RESPONSE
TO EMOTIONAL AND SEXUAL INTIMACY

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Psychology

by
William Todd Abraham
June 2001
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Approved by:

Dr. Robert E. Cramer, Chair, Psychology

Dr. Jodie B. Ullman

Dr. Frederick A. Newton

Date 6/7/01
ABSTRACT

An evolutionary perspective on human mating can be logically extended to predict sex differences in response to emotional and sexual intimacy. Currently, however, empirical evidence of such an extension is lacking. The present study was designed to 1) test whether an evolutionary perspective could accurately predict sex-linked behavioral differences in intimacy preferences, 2) test the abilities of evolutionary and socialization perspectives to adequately explain such sex differences, and 3) link expected evolved intimacy preferences with the notion of biologically-constrained behavior. Male (n = 73) and female (n = 69) undergraduates provided behavioral and attitudinal responses resulting from interaction with a fictitious member of the opposite sex. Behavioral responses were made through an instrumental conditioning procedure that measured men’s and women’s acquisition of a simple response reinforced by exposure to either sexually or emotionally intimate verbal material. Men and women also provided information concerning learned values placed on sexual and emotional aspects of their romantic relationships. Sex-differentiated response speeds were predicted in which men would respond faster than women.
when being reinforced with sexually intimate verbal material, and women would respond faster than men when reinforced with emotionally intimate verbal material. Furthermore, it was expected that controlling for the learned values men and women placed on the sexual and emotional aspects of their relationships would not alter the sex-differentiated response patterns. Men and women did demonstrate acquisition of the instrumental response in both the sexually and emotionally intimate conditions. However, sex-differentiated responses to sexually or emotionally intimate reinforcement were not observed. In addition, the values placed by men and women on sex and emotion were also unable to adequately predict the behavioral responses. Interestingly, behavioral and attitudinal consistency of women in the sexually intimate condition was not observed. Discussion focused on possible explanations for 1) the inability to demonstrate sex-differentiated responding, and 2) the observed discrepancy of women’s behaviors and attitudes when exposed to sexually intimate verbal material. In addition, the potential link between evolved psychological mechanisms and biological constraints on behavior is addressed.
ACKNOWLEDGMENTS

There are men charged with the duty of examining the construction of the planets, animals, and soils which are the instruments of the great orchestra. These men are called professors. Each selects one instrument and spends his life taking it apart and describing its strings and sounding boards. This process of dismemberment is called research. The place for dismemberment is called a university.

A professor may pluck the strings of his own instrument, but never that of another, and if he listens for music he must never admit it to his fellows or to his students. For all are restrained by an ironbound taboo which decrees that the construction of instruments is the domain of science, while the detection of harmony is the domain of poets.

Aldo Leopold

I would like to express, with deepest sincerity, my gratitude to Dr. Robert Cramer for imparting to me his belief that a professor should learn more than one instrument while striving to detect harmony. My relationship with Dr. Cramer has evolved from student to colleague to friend, and for that, I am grateful. We all take risks, and for Dr. Cramer’s willingness to take a chance on a student he did not know, nor expected would ask, I am deeply indebted - Thank you.

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CHAPTER ONE
INTRODUCTION

Psychological science has recently experienced a resurgence of theories and perspectives with an emphasis on biological factors to investigate human behavior. The current work attempts to 1) outline the central theoretical tenets of evolutionary psychology, 2) review relevant research relating evolutionary theory to mate selection, sexual jealousy, violations-of-trust in romantic relationships, and emotional and sexual intimacy, 3) discuss an alternative culturally-based perspective emphasizing social roles, and 4) present evidence from critical tests of socialization hypotheses that provides strong support for an evolutionary perspective. In addition, the current work presents a review of literature relevant to biological constraints and social analogues of learning paradigms. Finally, the current work presents an empirical attempt to integrate the notion of biologically constrained behavior resulting from evolutionary selection pressures with findings of sex-differentiated preferences for emotional and sexual intimacy.
Evolutionary Psychology

Although various biological perspectives exist, the majority rely heavily on the tenets of evolution through the means of natural (Darwin, 1859) and sexual (Darwin, 1871) selection. Of primary interest in the current work is an evolutionary psychological perspective that employs the principles of evolution to determine the causal bases of behavior and mental functioning. According to an evolutionary psychological perspective, the causality of human behaviors can be, in part, attributed to domain specific mental mechanisms. In theory, selection pressures (i.e., natural and sexual) have produced psychological mechanisms designed to achieve adaptive solutions to problems faced by ancestral humans (e.g., Buss, 1990, 1991, 1995, 1997; Janicki & Krebs, 1998; Kenrick, 1994; Symons, 1979; Tooby & Cosmides, 1992).

Much of evolutionary psychology (i.e., mate selection, sexual jealousy) owes its existence to the heuristic value of Trivers' (1972) parental investment theory. According to Trivers, the operation of sexual selection processes is predicated on biologically constrained differences between males and females in the minimal investment required to reproduce. Of particular relevance to humans, females
endure exponentially higher costs than males in the production of offspring. In terms of biological investment, females must gestate, nourish and give birth to their young, whereas males need only contribute a single reproductive cell (i.e., sperm). In theory, female investment is required after the young are born. Females continue to nurse, shelter, and provide for their offspring, whereas a male’s contribution may end after coitus. As a result of this disparity in minimal investment, Trivers argues, females should be highly selective when choosing a mate. Males, on the other hand, should discriminate less between potential mates, because they have less at stake when a pregnancy occurs.

Males, however, face a different reproductive problem in that when investment of resources is required, the potential for cuckoldry exists. According to Trivers, cryptic ovulation presents males with the reproductive problem of paternity uncertainty. Because resources can be difficult and dangerous to obtain and defend, Trivers argues that males only benefit in reproductive terms by investing such resources in offspring to which they are biologically related.
Perhaps the most influential work to date in evolutionary psychology is the development of Buss and Schmitt’s (1993) sexual strategies theory. Relying heavily on the work of Trivers, Buss and Schmitt assert that differential parental investment and sexual selection pressures pose sex-differentiated reproductive problems for men and women. Men, in theory, face the problem of gaining sexual access to multiple mates that are capable of producing viable offspring. Women, on the other hand, face the problem of securing a mate that is both capable and willing to provide necessary resources. The authors further assert that the apparent disparity in reproductive investment and the pressure to produce viable young resulted in the development of psychological mechanisms designed specifically to solve reproductively relevant problems.

Mate Selection Preferences

Sexual strategies theory has been investigated in a number of human mating studies. The results of this research have yielded consistent findings strongly supporting an evolutionary perspective. Evolutionary principles have reliably explained and predicted sex

Buss (1989) used the parental investment model (e.g., Trivers, 1972) to test mate selection preferences in 37 diverse cultures. Because women face a higher cost than men when reproducing and thus, benefit reproductively by mating with men capable of investing material resources, Buss predicted that women, more so than men, would value partners who demonstrated traits indicative of resource possession or resource potential. Specifically, women were predicted to place higher values than men on traits such as ambitiousness, industriousness, and earning capacity. Men, on the other hand, benefit reproductively by mating with women who possess reproductive ability or reproductive potential. Thus, Buss predicted that men, more so than women, would place a higher value on traits linked with reproduction such as youth and physical attractiveness. As
expected, women in the majority of the 37 cultures demonstrated a higher preference than did men for partners who were good financial prospects and industrious/ambitious. Similarly, in the majority of the cultures examined, men placed a higher premium than did women on partners who were younger than themselves and physically attractive.

Kenrick and Keefe's (1992) application of an evolutionary perspective to the study of age preferences in potential mates generated a unique prediction antithetical to mainstream psychological perspectives. Because a woman's age provides men with a cue concerning reproductive potential, and because men, in theory, prefer reproductively able women, Kenrick and Keefe argued that men's preferences concerning their potential partner's age should vary as a function of their own. Specifically, the authors predicted that discrepancies in age between men and the women they preferred would be less pronounced when men were young (i.e., in their 20s), and would become more pronounced as men aged. In addition, Kenrick and Keefe predicted that young men would be more likely to prefer women slightly older than themselves (i.e., those in their
mid to late 20s) because at such an age, a woman’s reproductive ability is not yet declining.

Data obtained from singles advertisements and marriage records from various locations and time periods supported Kenrick and Keefe’s prediction. As expected, young men demonstrated preferences for women who were five years younger and up to five years older than themselves. Older men (i.e., those in their 50s and 60s), however, indicated that the maximum acceptable age for a mate was far below their own. In addition, as men aged, minimum and maximum ages of acceptable partners became more discrepant from the ages of the men. Finally, Kenrick and Keefe’s (1992) use of cross-cultural and cross-generational samples demonstrated that such age effects were reliable both transculturally and transhistorically.

Consistent with evolutionary expectations, researchers have found that men prefer partners who are young, physically attractive, healthy, and sexually accessible. Women, on the other hand, prefer partners who possess resources, have resource potential, and demonstrate a willingness to share resources and commit to the relationship. In addition, such findings have proven robust in diverse cultures suggesting that such preferences may be
species specific, and not the result of specific cultural norms and practices.

Romantic Jealousy

Evolutionary theory has been extended to the study of jealousy as well (Buss, 2000). Using sexual strategies theory as a guide, researchers have demonstrated a robust sex difference in the trigger of sexual jealousy that is consistent with evolutionary predictions. For example, men are more distressed than women by a partner's sexual infidelity, as opposed to emotional involvement with a rival. Conversely, more women than men indicate that a partner's emotional involvement produces higher levels of distress than occurrences of sexual infidelity (e.g., Abraham, Cramer, Fernandez, & Mahler, in press; Buss, 1994, 2000; Buss, Larsen, Westen, & Semmelroth, 1992; Buss, Larsen, & Westen, 1996; Buss et al., 1999; Buunk, Angleitner, Oubaid, & Buss, 1996; Cramer, Abraham, Johnson, & Manning-Ryan, in press; Cramer, Abraham, & Johnston, 2001; Cramer, Manning-Ryan, Johnson, & Barbo, 2000; Wiederman & Allgeier, 1993).

Buss et al. (1992) argued that men and women should differ concerning the trigger of romantic jealousy in a
manner consistent with evolved mating strategies. Because women place a higher premium than do men on continued access to material resources, they should be most distressed when such continued access is threatened. Specifically, women attend to cues indicative of a man’s willingness to invest resources, which is most accurately signaled by his level of emotional commitment to the relationship. Thus, Buss et al. predicted that women, more so than men, would become distressed by a partner’s imagined development of an emotional attachment to another person. Men, on the other hand, face the possibility of investing valuable resources in children to which they are biologically unrelated. Thus, men are, in theory, expected to place a higher premium than women on cues indicative of paternity certainty, which is most accurately signaled by sexual fidelity. Therefore, Buss et al. predicted that men, more so than women, would become distressed by imagining their partner engaging in sexual relations with another person.

Consistent with evolutionary predictions, Buss et al. demonstrated that when responding to a forced-choice prospective measure, more men than women reported being distressed by a partner’s sexual infidelity as opposed to a
partner's emotional involvement with another person. Conversely, more women than men reported being distressed by a partner's emotional attachment to another person as opposed to a partner's sexual infidelity. These findings were substantiated through physiological measures in which men's electrodermal activity (EDA) was higher when imagining a partner's sexual infidelity and women's EDA was higher when imagining a partner's emotional involvement with someone else. Additional assessment of participants' pulse rates and electromyographic activity indicated similar patterns, however, such differences were not statistically reliable.

Buunk et al. (1996) replicated the findings of Buss et al. (1992) using samples from the Netherlands, Germany, and the United States. Buunk et al. demonstrated that across all three samples, more men than women reported being distressed by a partner's sexual infidelity, while more women than men were distressed by a partner's emotional infidelity. Additional studies investigating jealousy in racially diverse populations have demonstrated support for an evolutionary perspective in African Americans (Abraham et al., in press) and Mexican Americans (Cramer et al., 2001). Research has also demonstrated cross-cultural
support for an evolutionary perspective concerning sex differences in response to sexual and emotional infidelity using samples from China (Geary, Rumsey, Bow-Thomas, & Hoard, 1995), Japan and Korea (Buss et al., 1999), and Sweden (Wiederman & Kendall, 1999).

Violations-of-Trust

A logical extension of evolutionary based findings concerning mate selection and jealousy has resulted in predictable sex differences in response to other biologically relevant violations-of-trust among men and women (Abraham et al. in press; Cramer et al., 2000). According to Abraham et al. and Cramer et al., evolved premiums on specific traits relevant to mating can be logically expected to produce distress when those characteristics are no longer available. Using indicators of differentially valued traits, Abraham et al. (in press) and Cramer et al. (2000) demonstrated that men and women differ in the levels of distress they experience when characteristics consistent with evolved mating strategies may no longer be provided by their partners.

Cramer et al. (2000) asked men and women to imagine their partners committing biologically relevant sex-linked
violations-of-trust representing threats to financial security (i.e., your partner loses $10,000 of your savings, your partner is no longer able, or no longer desires to work), physical attractiveness (i.e., your partner gains 100 lbs, or no longer makes an effort to look physically attractive), and sexual accessibility (i.e., your partner is no longer able to have sexual intercourse). Consistent with evolutionary predictions, more men than women reported being distressed by threats to a partner's physical attractiveness and sexual accessibility. Conversely, more women than men reported being distressed by threats to their financial security.

In an extension of Cramer et al. (2000), Abraham et al. (in press) investigated similar threats to financial security and physical attractiveness, as well as, threats to a partner’s youthful appearance (i.e., your partner looks five years older due to premature graying) and level of commitment to the relationship (i.e., your partner insists you sign a prenuptial agreement before she/he is willing to commit to marriage). As expected, and consistent with an evolutionary perspective, more men than women were distressed by the male-linked violations, and more women than men were distressed by the female-linked violations.
In addition to replicating the findings of Cramer et al. (2000), Abraham et al.'s findings provide further validation for an evolutionary perspective by demonstrating sex differences in response to biologically relevant violations-of-trust in both African American and Caucasian samples.

Evolution and Socialization: Testing Competing Hypotheses

A social learning perspective offers the most widely accepted explanation for sex differences concerning various aspects of human mating. Typically, socialization perspectives attribute the causality of sex differences in interpersonal relations phenomena to the differential learning histories of men and women. Socialization pressures and conformity to social expectations (i.e., social roles) are viewed as the primary contributing factor responsible for the observance of sex-differentiated behaviors (e.g., Eagly, 1987, 1995; Eagly & Wood, 1999; for critical reviews see Archer, 1996; Buss, 1995). From this perspective, differential values held, and behaviors engaged in, by men and women are the result of learning what men and women should value and how they should behave.
In response to the development of an evolutionary perspective and the resultant findings produced by evolutionary researchers, socialization theorists have called for empirical evidence that pits evolution and socialization perspectives against each other through direct testing of competing hypotheses (e.g., Eagly & Wood, 1999; see also Archer, 1996). Evolutionary researchers have taken such a challenge to heart. Numerous studies have been designed to test competing hypotheses derived from socialization and evolutionary perspectives in areas concerning mate selection (e.g., Townsend, 1989; Wiederman & Allgeier, 1992) and romantic jealousy (e.g., Buss et al., 1999; Cramer et al., in press; Wiederman & Allgeier, 1993).

For example, Townsend (1989) tested the structural powerlessness hypothesis by examining mate preferences among female medical and college students. The structural powerlessness argument suggests that women's preference for mates who either possess resources or demonstrate the likelihood of possessing them in the future stems from societal pressures, which typically exclude women from gaining direct access to such resources. Therefore, women who are denied access to resources by societal constraints prefer resource-possessing men because such a preference
provides women with indirect access to those resources. Examination of female medical school and college students, Townsend argued, removes the influence of structural powerlessness in that, such women are relatively certain they will have direct access to material resources once they begin their careers.

Conversely, an evolutionary perspective argues that women’s preferences for men who possess resources stem from evolved psychological mechanisms designed to solve the female reproductive problem of acquiring resources required during pregnancy and child rearing. Based on evolutionary reasoning, and contrary to structural powerlessness expectations, Townsend predicted that women would continue to prefer resource-rich men even when direct access to resources was relatively assured. Consistent with an evolutionary perspective, Townsend demonstrated that female medical school and college students continued to place a higher premium than men of equal educational attainment on partners who possessed, or were likely to possess resources. Specifically, women indicated a higher preference than did men for partners with occupational status and income levels equal to, or higher than their own.
An alternative explanation for the observed sex difference in response to emotional and sexual infidelity has also been proposed (e.g., Harris & Christenfeld, 1996; see also DeSteno & Salovey, 1996). According Harris and Christenfeld (1996), men and women differ in their responses to a partner’s emotional or sexual infidelity not because of evolved psychological mechanisms, but rather, because of learned differences and logical beliefs concerning the relationship between love and sex. The alternative analysis argues that men are more distressed by a partner’s sexual infidelity than emotional infidelity because they have learned that women who are having sex are likely to be in love as well. Emotional infidelity, on the other hand, is less distressing to men, because they have learned that “women can be in love without having sex” (p. 364). Similarly, women are more distressed than men by a partner’s emotional attachment to another person because they have learned that when a man is in love, he is probably also having sex. Sexual infidelity, however, is viewed as less distressing to women because they have learned that “men often have sex without being in love” (p. 364). Thus, when men and women are asked to choose sexual or emotional infidelity as most distressing in a
forced-choice format, they logically choose the one that implies the co-occurrence of the other.

In order to test the logical beliefs explanation, Cramer et al. (in press) asked men and women to indicate which aspect of a partner’s involvement with another person would upset them the most in response to the following: “Imagine your partner forming a deep emotional attachment to another person and also enjoying passionate sexual intercourse with that person” (p. 11). Cramer et al. argued that presentation of the infidelities in combination indicating that both had, in fact, occurred, negated the ability of men and women to draw logical inferences about the co-occurrence of sexual and emotional infidelity (see also Buss et al., 1999; Cramer, Abraham, & Johnston, 2001). The authors further assert that such a presentation excludes predictions based on the alternative analysis, yet is still amenable to testing evolutionary hypotheses. Based on an evolutionary perspective, Cramer et al. predicted that more men than women would continue to choose a partner’s sexual infidelity as more distressing than emotional infidelity, and that more women than men would continue to choose a partner’s emotional infidelity as more distressing than sexual infidelity.
Consistent with expectations, and an evolutionary perspective, more men than women (86.70% vs. 59.40%) indicated that a partner’s sexual infidelity would be more distressing than emotional infidelity. Conversely, more women than men (40.60% vs. 13.30%) reported that a partner’s emotional infidelity would be more distressing than sexual infidelity. Cramer et al.’s findings concerning the co-occurrence of infidelities provide strong support for an evolutionary perspective, while demonstrating the limited ability of the alternative analysis to adequately explain and predict sex differences in response to emotional and sexual infidelity.

An additional, and perhaps more intuitively appealing challenge to the alternative analysis (e.g., DeSteno & Salovey, 1996; Harris & Christenfeld, 1996) is provided by Abraham et al.’s (in press) and Cramer et al.’s (2000) work concerning biologically relevant violations-of-trust (see Violations-of-Trust above). According to the authors, an evolutionary perspective accurately and parsimoniously predicts sex differences in response to biologically relevant violations-of-trust. However, the alternative analysis is unable to adequately explain such sex-differentiated responses because no differential learning
or logical inference can be inferred. For example, it is not logical to argue that a man chooses a threat to a partner's physical attractiveness as more distressing because it also implies that his partner no longer desires to work. Similarly, it cannot be argued that women choose a partner's insistence that a prenuptial agreement be signed before committing to marriage as more distressing because they have learned that it is also likely that he will look five years older due to premature graying. Abraham et al.'s and Cramer et al.'s findings are consistent with an evolutionary perspective, thus providing a serious challenge to the alternative analysis by demonstrating its inability to explain sex differences in subjective distress to more specific violations-of-trust.

Direct empirical tests of competing hypotheses derived from evolutionary and social learning theories have produced reliable support for an evolutionary perspective. Such tests have demonstrated that hypotheses derived from socialization approaches are typically limited, or not well suited to accurately explain and predict observed sex differences in various mating behaviors. The current study represents an additional evolutionary challenge to socialization accounts of observed sex differences in
preferences for sexual and emotional intimacy by attempting
to demonstrate that perspectives emphasizing culturally
based social roles cannot adequately address such
preferences.

Emotional and Sexual Intimacy

Although less specifically addressed by evolutionary
researchers, a robust sex difference in the types of
intimacy sought by men and women exists. Typically,
empirical findings demonstrate that men place a higher
premium than do women on sexual intimacy (e.g., Byers &
Lewis, 1988; Motley & Reeder, 1995; O’Sullivan & Byers,
1996; Peplau, Rubin, & Hill, 1977). Men tend, more so than
women, to pursue sexual intimacy during the early stages of
a relationship (e.g., Byers & Lewis, 1988; Clark, Shaver, &
Abrahams, 1999; Knoth, Boyd, & Singer, 1988; Motley &
Reeder, 1995; O’Sullivan & Byers, 1996; Roche, 1986).
Women, on the other hand, tend to place a higher premium
than do men on connectedness and intimacy that is emotional
in nature (e.g., Clark, Shaver, & Abrahams, 1999; Hatfield,
Sprecher, Pillemer, Greenberger, & Wexler, 1988; Ridley,
1993; Russell, 1996). Indeed, research findings demonstrate
that more men than women report a fear of emotional
intimacy in both adolescence (e.g., Sherman & Thelen, 1996) and adulthood (e.g., Descutner & Thelen, 1991; Doi & Thelen, 1993; Thelen, Vander Wal, Thomas, & Harmon, 2000).

Outside the context of a relationship, men’s and women’s preferences for pornographic/erotic material differ, in that men are inclined to seek material portraying a variety of anonymous men and women engaging in sexually explicit poses or behavior (e.g., Kenrick, Stingfield, Whagenhals, Dahl, & Ransdell, 1980; Symons, 1979). Women, on the other hand, tend to seek material that is couple-centered and contains some degree of connectedness between the individuals (e.g., Snitow, 1983). A similar disparity between men’s and women’s intimacy preferences is observed when assessing sexual fantasies. Men’s fantasies, compared to women’s fantasies, tend to highlight sexual aspects of, as opposed to emotional connectedness with, the fantasy target (e.g., Barclay, 1973; Ellis & Symons, 1990; Jones & Barlow, 1990; Wilson, 1987).

For example, Ellis and Symons (1990) investigated characteristics of men’s and women’s sexual fantasies and observed dramatic sex differences concerning their content. Men indicated that their fantasies typically involved
different partners, transitioned rapidly to sexual activity, and were rich with visual images. In contrast, women's fantasies usually contained a current or former partner as the target, developed more slowly, were more personal in nature, and focused on the emotional aspects of the fantasy target.

Behavioral assessments of men's and women's preferences for sexual and emotional intimacy are consistent with self-report and prospective measures. Clark and Hatfield (1989) had male and female confederates approach men and women on a college campus and ask if they would be willing to 1) go out on a date, 2) go back to the confederate's apartment, or 3) go to bed with the confederate. Across two studies, men and women did not differ in their affirmative response to go out on a date (53% of men and 50% of women agreed). However, when asked to go back to the confederate’s apartment, 69% of men agreed, whereas only 3% of women did so. The most striking behavioral sex difference involved the request to go to bed with the confederate. Of men, 72% agreed to sleep with the strange woman, whereas no woman (0%) agreed to sleep with the strange man.
A logical extension of such findings concerning women's preference for emotional intimacy (e.g., Hatfield et al., 1988; Ridley, 1993; Russell, 1996) suggests that the receipt of emotionally intimate material may be more rewarding than the receipt of sexually intimate material from a stranger. In contrast, it is also possible that the receipt of sexually intimate material from a stranger is aversive. Similarly, and consistent with findings concerning men and sexual intimacy, men may experience the receipt of sexually intimate material as more rewarding than the receipt of emotionally intimate material; emotionally intimate material may be aversive to men.

Despite the possibility of being addressed theoretically from an evolutionary perspective (e.g., Hatfield et al., 1988; Townsend, 1995), empirical tests concerning the causality or behavioral consequences of the apparent gender difference in preferred types of intimacy are currently lacking.

**Biological Constraints on Learning**

Although cultural adherents readily invoke social learning as a causal mechanism for behavior, the principles that govern learning (e.g., the principles of classical and
instrumental conditioning) are rarely understood or acknowledged. Particularly relevant to the current work, and most often overlooked by culturalists, is an understanding by most learning psychologists concerning the importance of an organism's biology (e.g., Domjan & Galef, 1983; Seligman, 1970; Shettleworth, 1994). Although addressed by different labels (i.e., biological constraints, adaptive specializations, etc.), most learning psychologists agree that the ability of an organism to make specific associations or to learn specific responses is contingent on the biologically-linked abilities of that creature. Indeed, cues relevant to digestion (i.e., taste) are associated with illness more readily than non-gustatory stimuli (i.e., audio-visual stimuli) in both rats (e.g., Garcia & Koelling, 1966) and humans (e.g., Etscorn, & Stephens, 1973).

Similar biological influences on behavior have also been addressed through examination of hormonal effects on cognitive abilities in humans (e.g., Christiansen & Knussmann, 1987; Kimura & Hampson, 1994; for a review see also Halpern, 1997; Halpern & LaMay, 2000). Kimura and Hampson's (1994) investigation of hormonal fluctuation and cognitive ability provides strong support for a link
between biological processes and observable abilities in women and men. Specifically, women’s performance on cognitive tasks typically favoring men (i.e., visual-spatial ability tasks) tends to fluctuate in a manner consistent with naturally occurring hormonal cycles. During the luteal phase of a cycle when estrogen and progesterone levels are relatively high, women consistently perform well on verbal ability and manual dexterity tasks, while performance on visual-spatial tasks tends to be poorer. However, during the premenstrual and menstrual phases of a cycle when estrogen and progesterone levels decrease, women’s performance on visual-spatial tasks increases. Similarly, men’s visual-spatial abilities also fluctuate with naturally occurring changes in hormonal levels; however, such levels in men vary seasonally. Specifically, men’s testosterone levels tend to be relatively low in autumn and highest during spring. Correspondingly, Kimura and Hampson (1994) demonstrated that male performance on visual-spatial tasks was relatively poor in autumn, but showed marked improvement when tested again in the spring suggesting that men’s cognitive abilities are also influenced by hormonal fluctuation (see also Christiansen & Knussmann, 1987).
Of primary interest to the current work is the assumption by learning psychologists that an organism must be capable (i.e., prepared) of acquiring the task at hand (Seligman, 1970). According to Seligman, an organism’s ability to perform a given response is dependent on that organism’s preparedness to do so. Seligman asserts that organisms can be either prepared, unprepared, or contraprepared to associate certain events and hence, to learn a task. The notion that an organism can be contraprepared in its ability to learn a task suggests that possible constraints on behavior exist. Such constraints on behavior are generally understood to be the products of evolutionary selection (Domjan & Galef, 1983). As Seligman (1970) states, “The organism may be more or less prepared by the evolution of its species to associate a given CS and US or a given response with an outcome.” (p.408, emphasis added).

Social Analogues of Learning Paradigms

The investigation of social phenomena using learning paradigms is not unfamiliar in psychology. Social analogues of conditioning procedures have been used to study competitive behavior (e.g., Steigleder, Weiss, Cramer, &
Feinberg, 1978), altruism (e.g., Stich, Weiss, Cramer, & Feinberg, 1987), attraction (e.g., Cramer, Helzer, & Mone, 1986; Cramer, Weiss, Steigleder, & Balling, 1985), and sex roles (e.g., Cramer, Lutz, Bartell, Dragna, & Helzer, 1989). For example, Cramer et al. (1989) employed an instrumental escape procedure to investigate women's responses to a masculine (i.e., Speaker 1) and an androgynous (Speaker 2) man. Disguised as an interpersonal communication study, women were presented with prerecorded comments on various topics from a traditionally masculine man via an intercom. After hearing the masculine man's comments, a conditioned stimulus (i.e., a light directing participants to press a button to hear from Speaker 2) was displayed and a latency timer began. Participants were required to perform an instrumental response (i.e., press a button on a control panel) in order to be exposed to the putative reinforcing properties of the androgynous man. In addition to the instrumental conditioning procedure, women were also asked to provide attitudinal assessments of the masculine and androgynous men.

Cramer et al.'s (1989) findings demonstrated that women prefer to receive communication from an androgynous man. In addition, communication from a traditionally
masculine man produced progressively faster escape responses in women. Consistent with their behavioral responses, women also rated the androgynous man as more honest, likable, intelligent, moral, and mentally healthy than the masculine man. In addition, women rated comments from the masculine man as less appropriate than those made by the androgynous man.

The use of conditioning paradigms to examine social behavior provides an invaluable benefit over more common self-report investigations. Primarily, such conditioning methodologies offer researchers the opportunity to assess behavioral responses as opposed to prospective or retrospective measures. In addition, researchers who employ a convincing masking task in conjunction with a conditioning procedure are also afforded the benefit of being able to assess attitudinal responses as well. Such attitudinal responses can then be compared to the behavioral responses providing a more complete and accurate picture of the phenomenon under investigation. Due to the potential benefits consistent with the use of such procedures, the current study employs an instrumental conditioning methodology to investigate sex differences in the modification of a simple response that results in
either a sexually or emotionally intimate verbal consequence.

Statement of the Problem

Consistent with Seligman’s (1970) notion of behavioral constraints, the current experiment attempts to demonstrate that men and women are prepared (i.e., unconstrained) or contraprepared (i.e., constrained) in their capacity to learn simple responses leading to specific outcomes. That is, men are assumed to be prepared to learn a response that results in exposure to sexually intimate verbal material. Women, in contrast, are assumed to be contraprepared to modify such behavior under the same conditions. Women are assumed to be prepared to learn a simple response that results in exposure to emotionally intimate verbal material. Men, in contrast, are assumed to be contraprepared to modify their behavior under the same conditions. Hence, sex-differentiated instrumental response (i.e., pressing a spacebar) speeds during acquisition and at asymptote are predicted.

Men’s response speeds to produce a sexually intimate verbal consequence are predicted to be significantly faster than the women’s response speeds. Hence, the asymptote of
the negatively accelerated learning curve for the men is predicted to be higher than the asymptote of the women’s learning curve (see Figure 1). In contrast, women’s response speeds to produce an emotionally intimate verbal consequence are predicted to be significantly faster than the men’s response speeds. Hence, the asymptote of the negatively accelerated learning curve for the women is predicted to be higher than the asymptote of the men’s learning curve (see Figure 2).

Arguably, the above predictions are consistent with both evolutionary and socialization perspectives. The current study will attempt to isolate the causal mechanisms underlying the asymptotic response differences among men and women by demonstrating that they are not the product of differential social learning. That is, the current study aims to statistically control for the influence of social learning, isolating the participant’s biological sex as the probable causal mechanism. Hence, it is expected that social learning will not significantly change the hypothesized sex-linked differences in the acquisition of the instrumental response.
Figure 1. Hypothesized Response Acquisition Curves Across Trials to Sexually Intimate Reinforcement
Figure 2. Hypothesized Response Acquisition Curves Across Trials to Emotionally Intimate Reinforcement
CHAPTER TWO

METHOD

Participants

Participants (N = 142) were male (n = 73) and female (n = 69) undergraduates at California State University, San Bernardino. Participants were recruited through the use of sign-up sheets and group appeals made in several classes. The only condition for participation required that the men and women speak English as a primary language. All participants were treated in accordance with the American Psychological Association's "Ethical Principles and Code of Conduct" (APA, 1992).

The average age of the men was 24.47 years. Men were Caucasian (n = 30, 41.1%), Hispanic (n = 18, 24.7%), African American (n = 15, 20.5%), Asian (n = 3, 4.1%), or self-reported as Other Non-White (n = 7, 9.6%). The majority of the men (n = 38, 52.1%) were single and not in a serious relationship. A large proportion (n = 22, 30.1%) reported being single but in a serious relationship. The remaining men were either married (n = 12, 16.4%) or divorced (n = 1, 1.4%).
The average age of the women was 25.93 years. Women were Caucasian (n = 32, 46.4%), Hispanic (n = 17, 24.6%), Asian (n = 10, 14.5%), African American (n = 8, 11.6%), or self-reported as Other Non-White (n = 2, 2.9%). The majority of the women (n = 28, 40.6%) were single and not in a serious relationship. A large proportion (n = 22, 31.9%) reported being single but in a serious relationship. The remaining women were married (n = 16, 23.2%), divorced (n = 2, 2.9%), or self-reported as "other" (n = 1, 1.4%).

Materials

In order to conduct the current study, a number of materials were employed. Two surveys, the Self-Perception Questionnaire (SPQ) and the Interpersonal Judgement Questionnaire (IJQ) were used (see below). In addition to the survey portions of the study, the experiment also employed a computer phase. The computer portion of the experiment was conducted using a desktop personal computer loaded with Micro-Experimental Laboratory Version 2.0 (MEL2®) software. Consistent with the use of a computer, the current study also required a keyboard and color monitor.
Demographics Questionnaire

Participants were asked to provide descriptive information about themselves, including gender, age, relationship status, and ethnicity.

Self-Perception Questionnaire (SPQ)

The SPQ contained a total of 36 items (3 subscales) adapted from several sources. In order to mask the six-item Sources of Relationship Rewards Scale (see below), a 23-item Self-Consciousness Scale (Fenigstein, Scheier, and Buss, 1975) was also included in the SPQ. These 23 items required participants to indicate their level of agreement with each statement on a 9-point Likert-type scale anchored with the terms (1) "I Strongly Disagree" and (9) "I Strongly Agree". Simpson and Gangestad's (1991) Sociosexual Orientation Inventory (SOI), designed to assess participants' individual sexual behaviors, provided the seven remaining SPQ items. Response to the SOI items required both open-ended numerical information, as well as levels of agreement on Likert-type scales consistent with those described above.

Items from Wiederman and Allgeier's (1993) Sources of Relationship Rewards Scale (SRRS) were randomly embedded within the first 29 items of the SPQ. Wiederman and
Allgeier (1993) used the SRRS to provide an assessment of the value men and women placed on the emotional and sexual aspects of their intimate relationships. Wiederman and Allgeier then used information provided by the SRRS to test a social learning analysis of sex-differentiated distress in response to a partner's hypothetical emotional or sexual infidelity. The six items contained within the SRRS include the following: 1) Sex is the best part of intimate dating relationships; 2) Being involved in an emotionally close dating relationship is very important to me; 3) It is important that my steady dating relationships include sexual activity; 4) The best part of intimate dating relationships is the emotional sharing and closeness; 5) Being involved in a sexual relationship with someone is very important to me; and 6) It is important that my dating relationships include a great deal of emotional intimacy and sharing. In the present study, the SRRS items were intended to provide an assessment of the learned value that men and women place on emotional and sexual intimacy in their romantic relationships. Participants indicated their level of agreement with each statement in a manner synonymous with that of the masking items described above.
(see Appendix A for the complete Self-Perception Questionnaire).

**Emotionally/Sexually Intimate Material**

The sexually intimate material was derived from pilot work that gathered information about activities or statements deemed sexually intimate by a separate sample of undergraduate men and women. Sexually intimate material included messages such as, “Personally, I would like to have sex in a variety of private and public places” (see Appendix B for the complete set of sexually intimate messages). The emotionally intimate material used in this study was adapted from Descutner and Thelen’s (1991) Fear-of-Intimacy Scale. Emotionally intimate material included messages such as, “I would want to trust my partner with my deepest thoughts and feelings” (see Appendix C for the complete set of emotionally intimate messages). To control for cognitive processing time, all messages were worded to ensure relative equivalence of the messages (i.e., 225 vs. 240 words) across the emotional and sexual conditions.

**Interpersonal Judgement Questionnaire (IJQ)**

The IJQ contained 14 items adapted, in part, from Byrne’s (1974) Interpersonal Judgement Scale. Consistent
with the impression-formation masking task, items on the IJQ pertained to attributes and characteristics of the person who “sent” the messages during the computer portion of the experiment. Contained within the IJQ were also a number of items designed as manipulation checks to determine if participants perceived the messages as the researchers intended. The purpose of the IJQ was to provide validation of participants’ response speeds by assessing impressions of the person sending the messages. Participants were asked to indicate their level of agreement to statements such as “I believe that this person is very intelligent” (see Appendix D for the complete Interpersonal Judgement Questionnaire). All responses were made using a 9-point Likert-type scale anchored with the terms (1) “I Strongly Disagree” and (9) “I Strongly Agree.”

Procedure

Upon arrival at the laboratory, participants were greeted by the experimenter and asked to sit in chairs placed outside the laboratory door. At this point, each participant was given a written informed consent to read. Volunteers then indicated that they understood their rights as research participants by placing an “X” on the informed
consent. Participants were not allowed to enter the laboratory until after providing their written consent.

Phase 1

Upon entering the laboratory, participants were seated at a table capable of accommodating two people. At this point, the experimenter described the purpose of the research and reiterated the project description contained within the informed consent. Participants were then asked to complete the demographic survey and the SPQ. When Phase 1 has been completed, participants were assigned to a computer based on a random assignment to conditions. Men and women were randomly assigned to receive either sexually or emotionally intimate messages. It is at this point that Phase 2 of the experiment began.

Phase 2

Participants' response speeds to emotionally and sexually intimate material were measured using an instrumental conditioning methodology disguised to resemble an Internet chat-room atmosphere. Under the guise of an impression formation study, each participant was exposed to a total of 20 trials during the conditioning procedure. Sixteen trials (80%) included either emotionally or sexually intimate material. In order to assure that male
and female participants attended to each message (in keeping with the masking task) in both the sexually and emotionally intimate conditions, four trials of the task in both conditions included requests for participants to evaluate the individual sending the messages. The material presented during the four evaluation trials was selected randomly from the IJQ, but did not vary across participants or conditions. On the evaluation trials, participants were asked to indicate their level of agreement (i.e., Agree or Disagree) with each statement using a paper and pencil scale. The evaluation trials were randomly embedded within the series of 20 trials.

Once at the computers, participants were presented with the first instructional screen of the instrumental conditioning procedure. At this point, the experimenter asked the participants to read and follow the onscreen instructions. Through the onscreen instructions, participants were again informed of the nature of the experiment (i.e., an impression formation study). In addition, participants were instructed that, "Women will receive messages from only one man and men will receive messages from only one woman." Participants also received onscreen instructions concerning the responses required on
the evaluation trials discussed above (see Appendix E for the complete set of onscreen instructions). Finally, participants were informed through the use of one practice trial that the person sending the messages was currently not dating anyone. A message reading, “No, I am not seeing anyone steadily right now.” was displayed.

Participants were told that in order to standardize the message exposure period, the computer portion of the experiment followed a standard sequence. The sequence occurred as follows: First, participants viewed a screen instructing them to “Press Spacebar to Read New Message.” Although not revealed to participants, this first screen represented the conditioned stimulus (CS) of the instrumental procedure. At this point, an internal clock began recording latency data in milliseconds (ms). The CS screen terminated provided participants performed the requested response within 7000ms. Failure to provide the correct response resulted in a cycling of the sequence to the next trial without exposure to the consequence of the trial on which no response was made. It was expected that participants would press the spacebar, that is perform the instrumental response (IR), in accordance with the instructional set they had previously viewed. Upon pressing
the spacebar, a blank screen representing an inter-stimulus delay (ISD) was immediately displayed on the screen. The ISD terminated only after a 3000ms duration. Immediately following the ISD, participants received a message or an evaluation request (i.e., the consequence) corresponding with each of the 20 trials. The consequence screen terminated after a 15000ms duration. At no point during the consequence phase of the trial could participants move the study along faster through any type of response. Immediately following the termination of the consequence, a second blank screen representing an inter-trial delay (ITD) was displayed. The ITD terminated only after a 7000ms duration. The standardized sequence was then repeated until all trials had been completed. After the completion of the last trial, a screen instructed participants that they were ready to begin the next phase (Phase 3) of the study. At this time, the experimenter instructed participants to take their respective seats once again at the front table.

Phase 3

During Phase 3 of the experiment, participants were asked to complete the IJQ. The experimenter reiterated that the IJQ was designed to measure attitudes toward and impressions of the person who sent the messages. Upon
completion of the IJQ, participants were given a written
debriefing and offered the opportunity to ask questions.
CHAPTER THREE

RESULTS

Adjustment of Latency Data for Trials

Latency data for responses made during the instrumental conditioning procedure were examined on an individual basis for extremely fast or extremely slow response times. In order to reduce variance within an individual participant’s responses, extreme values were adjusted for each person. Extreme values were predetermined to exist if a response time on any one trial was three times faster or slower than the preceding trial. In order to adjust such extreme values, the mean of the trial immediately preceding and the trial immediately following the extreme trial was substituted for the extreme value. In cases where the extreme value occurred on the last trial (i.e., Trial 20) of the conditioning procedure, the mean of the immediately preceding two trials (i.e., Trials 18 and 19) was substituted for the extreme value.

The proportions of such adjustments were approximately equal across intimacy conditions and genders. Adjustments were made to 13.75% and 10.00% of the trials for men in the emotionally intimate and sexually intimate conditions,
respectively. Similarly, adjustments were made to 11.53% and 10.91% of the trials for women in the emotionally intimate and sexually intimate conditions, respectively. When collapsed across intimacy conditions, adjustments were made to 11.44% of the trials for men and 11.23% of the trials for women.

Manipulation Check

In order to ensure that the analysis was performed on only those who correctly perceived the material as either sexual or emotional in nature, manipulation check items from the IJQ were assessed. Men (n = 45) and women (n = 33) in the sexually intimate condition had to yield a positive value when their score for the extent to which they viewed the material as emotional in nature (IJQ 10) was subtracted from their score for the extent to which they viewed the material as sexual in nature (IJQ 5). Men (n = 18) and women (n = 8) that yielded negative values (i.e., indicated that they perceived the material as more emotional than sexual in nature), or no difference (i.e., indicated that they perceived the material as equally emotional and sexual) were excluded from further analysis. Conversely, men (n = 28) and women (n = 36) in the emotionally intimate
condition had to yield a positive value when their score for the extent to which they viewed the material as sexual in nature (IJQ 5) was subtracted from their score for the extent to which they viewed the material as emotional in nature (IJQ 10). Men (n = 4) and women (n = 11) that yielded negative values (i.e., indicated that they perceived the material as more sexual than emotional in nature), or no difference (i.e., indicated that they perceived the material as equally emotional and sexual) were also excluded from further analysis. The manipulation check procedure reduced the entire sample of 142 to 101 upon which the following analyses were conducted.

In order to assess whether men and women in each of the intimacy conditions who did or did not meet the manipulation check requirements differed substantially, independent samples t-tests and chi-square analyses were conducted on demographic variables, the six items from the SRRS, and the seven items from the SOI. Across intimacy conditions, those who met the manipulation check did not differ (all ps > .05) from those who did not on any of the demographic variables (i.e., age, ethnicity, and relationship status). In addition, women in the sexually intimate condition did not differ on any of the SRRS or SOI
items regardless of whether they did or did not meet the manipulation check requirements (all ps > .05).

Women in the emotionally intimate condition did differ from those who did not meet the manipulation check on Item 3 of the SOI assessing the number of "one-night stands" in which participants had engaged. Women who met the manipulation check reported engaging in less one-night stands (M = 0.72) than those that did not meet the manipulation check (M = 3.36), t(34) = 2.065, p < .05. Similarly, men in the emotionally intimate condition who met the manipulation check differed from those who did not on the importance of being involved in an emotionally close dating relationship (SRRS Item 2), and SOI Item 5 assessing the extent to which sexual activity without emotional involvement is acceptable. Men who met the manipulation check indicated that being involved in an emotionally close dating relationship was more important to them (M = 6.21) than did those who failed to meet the manipulation check (M = 3.75), t(26) = -2.078, p < .05. In addition, men who failed to meet the manipulation check were more accepting of sexual activity without emotional involvement (M = 7.00) than were those who met the manipulation check (M = 3.75), t(26) = 2.310, p < .05.
Table 1 shows that men who did or did not meet the manipulation check in the sexually intimate condition differed substantially on a number of the SRRS items. Men who met the manipulation check reported higher values, on average, to five of the six SRRS items than did men who failed the manipulation check.

Table 1. Sources of Relationship Rewards Scale Differences Among Men Who Did or Did Not Meet the Manipulation Check in the Sexually Intimate Condition

<table>
<thead>
<tr>
<th>SRRS Item</th>
<th>Met Check M</th>
<th>Failed Check M</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important that my steady dating relationships include sexual activity</td>
<td>5.12</td>
<td>3.37</td>
<td>-2.323</td>
<td>.025</td>
</tr>
</tbody>
</table>

48
Table 1 cont.

<table>
<thead>
<tr>
<th>SRRS Item</th>
<th>Met</th>
<th>Failed</th>
<th>Check</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being involved in a sexual relationship with someone is very important to me</td>
<td>5.08</td>
<td>3.21</td>
<td>-2.549</td>
<td>.014</td>
</tr>
<tr>
<td>Being involved in an emotionally close dating relationship is very important to me</td>
<td>6.69</td>
<td>5.00</td>
<td>-2.493</td>
<td>.017</td>
</tr>
<tr>
<td>The best part of my intimate dating relationships is the emotional sharing and closeness</td>
<td>6.96</td>
<td>5.53</td>
<td>-2.515</td>
<td>.016</td>
</tr>
</tbody>
</table>
Table 1 cont.

<table>
<thead>
<tr>
<th>SRRS Item</th>
<th>Met</th>
<th>Failed</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Check</td>
<td>Check</td>
<td></td>
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</table>

It is important that my dating relationships include a great deal of emotional intimacy and sharing.

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<tr>
<td></td>
<td>M</td>
<td>M</td>
<td>t</td>
</tr>
<tr>
<td></td>
<td>7.04</td>
<td>5.74</td>
<td>-2.16</td>
</tr>
</tbody>
</table>

Statistical Assumptions and Outliers

Examination of distributions for the SRRS items assessing the value of emotional sharing and closeness in a relationship, and the importance of emotional intimacy and sharing in a dating relationship revealed that both variables were severely negatively skewed ($z = -6.47$ and $z = -4.82$, respectively). Further examination of the raw data revealed that both men and women tended to assign relatively high scores to these items. Linearity was assessed through a scatterplot of the most normally (i.e.,
SRRS_{sex3}) and abnormally (i.e., SRRS_{emotion2}) distributed variables. The scatterplot revealed that the assumption of linearity might not have been met. Homogeneity of variance is assumed to have been met in that sample sizes per cell were approximately equal. In addition, assessments of Levene’s tests of the equality of error variances were not significant (all ps > .05).

In order to assess the assumption of homogeneity of regression, centered interactions between gender and the covariates (i.e., values placed on the sexual and emotional components of a relationship) were regressed on trials in each of the four conditions (i.e., men-sex, men-emotion, women-sex, and women-emotion). Results of the regression analyses revealed a violation of the homogeneity assumption in that the centered interactions were, in some cases, reliably predicting response speeds. Such an interaction indicated that use of the SRRS items as continuous covariates would create sex-differentiated adjustment of response speeds for men and women. Thus, the originally intended use of the SRRS items was modified (see section on Speed Transformation and Covariate Construction below).

Assessment of univariate outliers was conducted by examining standardized scores on the SRRS items. Univariate
outliers were detected for 11 responses across the entire sample. It is assumed that such outliers presented true scores. Thus, a decision was made to retain for the analysis those individuals who produced extreme scores on the covariates. Extreme scores were adjusted using a predetermined procedure in which the individual would be removed from the sample in order to obtain a distribution free of extreme scores. A raw score was then calculated to correspond with the criterion (i.e., $z = \pm 3.30$, $p = .001$) for detecting extreme scores. The calculated value was then substituted for the original extreme score. This procedure maintained the integrity of each score as extreme in relation to the group, however, brought outliers back into the normal distribution. No assessment of extreme values for trial data in addition to that described above was performed. A decision was made that any additional adjustment to the trials data would artificially reduce individual variance within each cell of the study.

Speed Transformation and Covariate Construction

In order to test the hypotheses, response latencies were converted to response speed values using a standard (i.e., 100/latency) transformation. Response speeds for the
20 trials were then grouped into five blocks of four trials. Response speed blocks were created by calculating a single mean response speed for each block.

Originally, the SRRS items were to be used as continuous covariates. However, due to the problems with sex-differentiated adjustment (see above), a treatment by blocks design was incorporated. Scores on the SRRS items were split into a sexual (SRRS\textsubscript{sex}) and emotional (SRRS\textsubscript{emotion}) component. A mean was then calculated for each participant's responses to the three items corresponding to the value placed on sexual intimacy and the three items corresponding to the value placed on emotional intimacy. A median split was then conducted within each of the four conditions for both the emotional and sexual component of the SRRS. This procedure produced a categorical variable with approximately equal high and low groups for both the sexual and emotional components.

Testing the Hypotheses

In order to test the hypothesis that men and women would produce different asymptotic acquisition speeds as a function of the type of intimate material they experienced, two identical 2 (participant sex) X 2 (value placed on
sexual or emotional aspect of relationship) X 5 (trials) repeated measures Analyses of Variance (ANOVA)s were conducted on responses provided by those in the sexually intimate condition and those in the emotionally intimate condition. In addition, trends were assessed to correct for a violation of sphericity in both the sexually intimate and emotionally intimate conditions.

Men and women in the sexually intimate condition did demonstrate an effect for trials indicating that acquisition of the instrumental response over trials occurred, $F_{lin}(1, 48) = 44.025, p < .001$, partial $\eta^2 = .478$). Further examination of the effects for trials revealed a significant second-order trend as well, $F_{quad}(1, 48) = 12.318, p < .01$, partial $\eta^2 = .204$. Contrary to expectations, however, men and women did not demonstrate sex-differentiated acquisition to the sexually intimate material (see Figure 3), for the linear component of trials x gender interaction, $F_{lin}(1, 48) = 0.035, p > .05$. In addition, no between-subjects effects were observed for gender [$F(1, 48) = 1.092, p > .05$] or the gender x SRRS$_{sex}$ interaction, $F(1, 48) = .001, p > .05$. 

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Lack of a linear component of trials x SRRS<sub>sex</sub> interaction \[ F_{\text{lin.}}(1, 48) = 0.736, \ p > .05 \] indicated that response speeds were also not differentially influenced by the values that men and women placed on the sexual component of their intimate relationships.

![Figure 3. Response Acquisition Curves for Men and Women When Responding to Sexually Intimate Reinforcement](image-url)
Finally, the linear component of trials x gender x SRRS_{sex} interaction suggests a relationship between the value men and women place on the sexual aspect of their intimate relationships, and the speed of their responses to sexually intimate verbal material, $F_{lin.}(1, 48) = 5.423, p < .05$, partial $\eta^2 = .102$. Figure 4 demonstrates that the value placed on sex by men in the sexually intimate condition is inconsistent with their behavioral responses across Blocks 4 and 5.
Figure 4. Three-Way Interaction Between Participant Sex, Value Placed on Sex, and Trials for Men in the Sexually Intimate Condition

Figure 5 demonstrates that the value placed on sex by women in the sexually intimate condition is consistent with their behavioral responses across Blocks 4 and 5, suggesting that the linear component of trials x gender x SRRS_{sex} interaction is the result of a relationship between values
placed on sex and behavioral responses that is different for men and women.

Figure 5. Three-Way Interaction Between Participant Sex, Value Placed on Sex, and Trials for Women in the Sexually Intimate Condition
Consistent with the results obtained for sexually intimate reinforcement, men and women in the emotionally intimate condition demonstrated an effect for trials, indicating that acquisition of the instrumental response occurred, $F_{\text{lin.}}(1, 45) = 34.884, p < .001$, partial $\eta^2 = .437$. Further examination of the effects for trials revealed significant second-order $[F_{\text{quad.}}(1, 45) = 5.721, p < .05$, partial $\eta^2 = .113]$ and third-order $[F_{\text{cubic.}}(1, 45) = 7.211, p = .01$, partial $\eta^2 = .138]$ trends as well. However, men and women failed to show sex-differentiated acquisition to the emotionally intimate material (see Figure 6), for the linear component of trials x gender interaction, $F_{\text{lin.}}(1, 45) = 0.120, p > .05$. Again, no between-subjects effects were observed for gender $[F(1, 45) = 0.880, p > .05]$ or the gender x SRRS_{emotion} interaction, $F(1, 45) = 0.559, p > .05$.

Lack of a linear component of trials x SRRS_{emotion} interaction, $F_{\text{lin.}}(1, 45) = 0.150, p > .05$, again indicated that response speeds were not differentially influenced by the values that men and women placed on the emotional aspect of their intimate relationships. Finally, no potential relationship for the linear component of trials x
gender $\times$ SRRS_{emotion} interaction in the emotionally intimate condition was observed, $F_{lin.}(1, 45) = 0.100$, $p > .05$.

Figure 6. Response Acquisition Curves for Men and Women
When Responding to Emotionally Intimate Reinforcement
Analysis of Attitudinal Measures

In order to determine whether men and women differed in their impressions of and attitudes toward the individual sending the messages, items from the IJQ were analyzed using a series of independent samples t-tests. Prior to analysis, three subscales (i.e., IJQ general scale, Likeability, and Attraction) were created by computing a mean for items corresponding to each subscale. The IJQ general scale combined Items 1-4 (Cronbach’s $\alpha = .81$) from the IJQ assessing participants’ responses concerning the sender’s intelligence, knowledge of current events, morality, and overall adjustment, respectively. The Likeability scale combined IJQ Items 6 and 7 (Cronbach’s $\alpha = .92$) assessing participants’ responses concerning the extent to which they liked the sender and how much they would be willing to work with the sender in an experiment, respectively. Finally, the Attraction scale combined IJQ Items 11, 12, and 13 (Cronbach’s $\alpha = .95$) assessing participants’ responses concerning the extent to which they would like to meet, date, and enter a long-term romantic relationship with the sender, respectively. In addition to the three subscales, possible gender differences concerning
the extent to which participants thought the sender 1) was physically attractive (IJQ 8) and 2) behaved appropriately (IJQ 9) were also examined.

Men and women did not differ in their impressions of and attitudes toward the sender in the emotionally intimate condition (all ps > .05). However, Table 2 shows that men and women in the sexually intimate condition did differ in their impressions of and attitudes toward the sender in a manner consistent with evolutionary expectations. Men reported higher values than women when assessing the sender on the dimensions of the IJQ general, Likeability, and Attraction scales. In addition, men reported higher values than women when asked to indicate whether they felt the sender of the sexually intimate messages was physically attractive and had behaved appropriately.
Table 2. Differences Between Men’s and Women’s Attitudinal Ratings of the Person Sending the Sexually Intimate Messages

<table>
<thead>
<tr>
<th>IJQ Measure</th>
<th>Men</th>
<th>Women</th>
<th>t</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Scale</td>
<td>4.77</td>
<td>3.45</td>
<td>2.942</td>
<td>.005</td>
<td>.148</td>
</tr>
<tr>
<td>Likeability Scale</td>
<td>5.22</td>
<td>2.44</td>
<td>4.819</td>
<td>&lt;.001</td>
<td>.317</td>
</tr>
<tr>
<td>Attraction Scale</td>
<td>4.42</td>
<td>1.80</td>
<td>4.898</td>
<td>&lt;.001</td>
<td>.324</td>
</tr>
<tr>
<td>Physically</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attractive</td>
<td>5.15</td>
<td>3.00</td>
<td>4.019</td>
<td>&lt;.001</td>
<td>.244</td>
</tr>
<tr>
<td>Behaved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriately</td>
<td>4.37</td>
<td>3.04</td>
<td>2.138</td>
<td>.037</td>
<td>.084</td>
</tr>
</tbody>
</table>

Predicting Behavioral Responses From Attitudinal Measures

As a final follow-up analysis, men’s and women’s scores for the IJQ measures discussed above were entered into a series of linear regression analyses to determine whether participant’s impressions of and attitudes toward the sender accurately predicted response speeds. The five
IJQ measures were entered into five separate regression analyses in which Block 1, Block 2, Block 3, Block 4, or Block 5 was entered as the criterion. The regression analyses indicated that men’s and women’s attitudinal responses were not able to reliably predict their behavioral responses when viewing material in either the sexually intimate or emotionally intimate conditions (all ps > .10).
CHAPTER FOUR
DISCUSSION

The integration of ideas derived from Darwin’s (1871) theory of sexual selection has guided the development of an evolutionary approach to the study of human mating. An evolutionary approach has also led to the development of heuristic theories such as Trivers’ (1972) parental investment theory and Buss and Schmitt’s (1993) sexual strategies theory. Using parental investment theory and sexual strategies theory as guides, researchers have produced a wealth of findings concerning human mating phenomena (e.g., Buss, 1994, 1999, 2000).

Specifically, studies have shown that men and women differ in the characteristics or traits they value in a potential mate (e.g., Buss, 1987; Buss & Barnes, 1986; Cramer et al., 1996; Landolt, Lalumiere, & Quinsey, 1995; Sprecher, 1989; Wiederman, 1993). Men prefer women who are young, physically attractive, sexually accessible, and sexually faithful. Women, on the other hand, prefer men who are older, socially dominant, have high social status, and possess resources they are willing to share. In addition,
these mate preferences are evident in numerous diverse cultures around the world (Buss, 1989).

An evolutionary perspective has also been instrumental in the development of a better understanding of the events that trigger romantic jealousy in men and women (e.g., Abraham et al., in press; Buss, 2000; Buss, Larsen, & Westen, 1996; Buss et al., 1992; Cramer et al., in press; Cramer, Abraham, & Johnston, 2001; Cramer et al., 2000). For example, men, more so than women, report that a partner's sexual infidelity is more distressing than emotional infidelity. In contrast, more women than men report that a partner's emotional involvement with another person is more distressing than sexual infidelity. Such findings of sex-differentiated triggers for romantic jealousy are stable in both racially diverse (e.g., Abraham et al., in press; Cramer, Abraham, & Johnston, 2001) and multicultural (e.g., Buss et al., 1999; Buunk et al., 1996; Geary et al., 1995; Wiederman & Kendall, 1999) samples.

Sex differences in mate preferences and the triggers of romantic jealousy have more recently been logically and empirically extended to violations-of-trust (e.g., Abraham et al., in press; Cramer et al., 2000). Abraham, et al. and Cramer, et al. have demonstrated reliable sex differences
in subjective distress when men and women are confronted with various biologically-relevant threats derived from evolved mate preference characteristics. For example, men are more distressed than women by threats to a partner’s physical attractiveness, sexual accessibility, and older appearance. Women, on the other hand, are more distressed than men by threats to a partner’s resources and level of commitment to the relationship.

Summary of Findings

Behavioral Measures

Consistent with an evolutionary perspective, men place a higher premium on the sexual aspects of male/female relationships (e.g., more partners, more variety, interest in pornography) than do women. Hence, men were predicted to respond faster than women when the consequence of such responses resulted in a sexually intimate verbal outcome. Conversely, women, in theory, place a premium on the emotional aspects of male/female relationships (e.g., couple-centered intimacy) because these serve as cues to a partner’s willingness to commit to the relationship, and signals continued access to necessary resources. Women, therefore, were predicted to respond faster than men when
the consequence for doing so was emotionally intimate reinforcement. Although men and women did demonstrate acquisition of the instrumental response, the current study's attempt to extend an evolutionary perspective to robust gender differences concerning emotional and sexual intimacy was unable to demonstrate sex-differentiated acquisition contingent on emotionally or sexually intimate reinforcement.

A socialization perspective would also predict that men and women would differ in their response speeds as a function of the type of material they received. However, such a perspective would have expected such differences to occur as a result of gender-differentiated values that men and women have learned to place on sexual and emotional intimacy. Findings in the current study do not support the socialization argument. Wiederman and Allgeier's (1993) SRRS items were specifically used in this study to provide such a measure of the learned value men and women place on the emotional and sexual aspects of their intimate relationships. Analysis of the response speed data did not demonstrate effects for the SRRS items in either the emotionally or sexually intimate conditions. The values placed by men and women on sexual and emotional intimacy
did not differentially predict behavioral responses to sexually or emotionally intimate reinforcement.

Attitudinal Measures

Men and women did differ in their attitudes about the person supposedly sending the messages. Men indicated that they liked, and were attracted to the woman sending sexually intimate messages more so than did women in response to the sexually intimate man. Although no predictions were made concerning attitudinal differences, these results are consistent with an evolutionary model. According to Buss and Schmitt (1993) men possess evolved mechanisms that place a premium on gaining sexual access to women. This premium on sexual access, in theory, makes sexually intimate communication from a woman extremely salient to men. Consistent with an evolutionary framework, men, more so than women, engage, or prefer to engage in sexual activity devoid of emotional involvement (e.g., Barclay, 1973; Clark & Hatfield, 1989; Ellis, & Symons, 1990; Jones & Barlow, 1990; Townsend, 1995; Wilson, 1987).

Women, on the other hand, are expected to be less willing to engage in sexual encounters devoid of emotional commitment. This tendency to avoid such encounters can be explained in terms of biologically related differences in
minimal parental investment (Trivers, 1972). Specifically, women who do engage in sexual behavior lacking emotional involvement face a reproductive disadvantage in relation to women who mate with men willing to commit vital resources to the provisioning and care of resultant offspring.

Findings from numerous studies and various perspectives provide evidence in support of this tendency in women (e.g., Byers & Lewis, 1988; Clark & Hatfield, 1989; Hatfield et al., 1988; Motley, & Reeder, 1995; O’Sullivan & Byers, 1996; Ridley, 1993; Roche, 1986; Russell, 1996).

Because of their emphasis on emotional involvement, women would be expected to dislike a man who repeatedly presented sexually intimate messages devoid of cues signaling emotional connectedness.

Men and women in the emotionally intimate condition did not differ in their attitudes about the sender. Evolutionarily speaking, women would be expected to respond favorably to a man who communicated in an emotionally intimate manner. Findings concerning women’s responses to the emotionally intimate man are also consistent with a robust observation in the intimacy literature that women place more emphasis on emotional connectedness than do men.
(e.g., Hatfield et al., 1988; Kenrick et al., 1980; Ridley, 1993; Russell, 1996).

However, the finding that men also responded favorably to the supposed emotionally intimate woman is inconsistent with what an evolutionary perspective would predict. According to Buss & Schmitt's (1993) sexual strategies theory, men possess evolved reproductive strategies aimed at maximizing sexual access to fertile and receptive women. In reproductive terms, men benefit most, especially in short-term mating, by gaining sexual access to multiple women with little or no investment of their emotional and/or material resources.

Two possible explanations for men's favorable attitudinal responses toward the emotionally intimate woman exist. First, Buss (1994, 1999) suggests that men often employ a deceptive mating strategy in which they feign interest in emotional involvement in order to gain sexual access to women. According to Buss, men were much more likely than women (71% vs. 39%) to exaggerate their level of emotional connectedness in order to engage in sexual activity with a partner. In addition, more women than men (97% vs. 59%) indicated that they had been deceived in this manner by a partner in the past. A second possible
explanation centers on a robust effect in which men tend to over-estimate the sexual intent of friendly communication by women which has been demonstrated using both videotaped (Abbey, 1982) and photographed (Abbey & Melby, 1986) interactions between women and men.

**Behavioral and Attitudinal Similarity**

Attitudinal and behavioral similarity was observed for men and women in the emotionally intimate condition. Men and women reported approximately equal levels of liking and attraction to the person sending the emotionally intimate messages. Consistent with their attitudinal responses, men and women also did not differ in their behavioral responses. This finding presents a potential paradox in that the intimacy literature is wrought with examples of a robust aversion in men to emotional intimacy (e.g., Descutner & Thelen, 1991; Doi & Thelen, 1993; Sherman & Thelen, 1996; Thelen et al., 2000).

Two possible explanations, one theoretical and one methodological (see Methodological Issues below), can be argued for the apparent contradiction between the current study’s findings and the intimacy literature. Buss et al.’s (1992) investigation of sex differences in response to
emotional and sexual infidelity yielded results supporting an evolutionary perspective. More women than men reported being distressed by a partner’s emotional infidelity, and more men than women reported being distressed by a partner’s sexual infidelity. Interestingly, Buss et al. found that the magnitude of the gender effect was moderated by whether the men had actually been in a committed sexual relationship. Men who had experienced a committed sexual relationship were more likely to be distressed by a partner’s sexual infidelity (55%) than by a partner’s emotional infidelity (45%). Conversely, men who had never been in a committed sexual relationship were more likely to be distressed by a partner’s emotional infidelity (71%) than by a partner’s sexual infidelity (29%).

Buss and Shackelford (1997) suggest that such an effect results from the nature of evolved psychological mechanisms. Such mechanisms are recognized as being highly context-specific. That is, activation of evolved mechanisms requires the person to actually experience the context in which a given mechanism was designed to operate. Although the current study measured current relationship status, no assessment of participants’ relationship histories was made. Therefore, it is logical to argue, based on the
assumption that Buss and Shackelford are correct, that the disparity in findings between the current study and the intimacy literature may have resulted, in part, from a lack of activation of evolved mechanisms that differentiate sexual and emotional intimacy based on inexperience with the appropriate context.

Behavioral responses of women were not consistent with their attitudes about the sender in the sexually intimate condition. As mentioned above, women's ratings concerning their overall impression, degree of likeability, and level of attraction toward the sender were lower than those of men. However, examination of the plotted response speeds across blocks of trials (see Figure 3) indicates that women's behavioral responses toward the sexually intimate man were faster (although not significantly) than men's responses toward the sexually intimate woman.

A possible explanation for the apparent contradiction between women's behavioral and attitudinal responses concerns the extent, if any, to which sexually intimate communication from a stranger is reinforcing to women. The intimacy literature consistently demonstrates that women are less inclined than men to seek sexually intimate interaction in the early stages of a relationship (e.g.,
Byers & Lewis, 1988; Clark & Hatfield, 1989; Motley & Reeder, 1995; O’Sullivan & Byers, 1996; Roche, 1986). A possibility exists that for women, sexually intimate communication sent by a stranger does not provide a reinforcing consequence. Rather, the intimacy literature suggests women may perceive such an event as aversive. If so, women’s responses in the sexually intimate condition may not actually represent speeds to acquisition, but rather, could be interpreted as avoidance/escape responses (e.g., trying to move the experiment along faster). However, this interpretation is very speculative and not strongly corroborated by the plotted response speeds across blocks of trials (see Figure 3), which appear to demonstrate predictable, orderly acquisition of the instrumental response across trials.

Methodological Issues

Absence of the expected effects for participant sex requires that a number of methodological issues be addressed. A possible, and perhaps most likely, explanation for the inability to demonstrate sex-differentiated acquisition to emotionally and sexually intimate verbal material lies in the number of trials used in the current
study. Although the use of 20 trials (80% reinforcement) appears to have demonstrated acquisition of the instrumental response, it is expected that a complete picture of men’s and women’s response patterns was not observed.

Results indicated that men in the emotionally intimate condition demonstrated a third-order (i.e., cubic) trend, which deserves attention. Examination of the plotted response speeds across blocks of trials for the sexually (see Figure 3) and emotionally (see Figure 6) intimate material appears to indicate a change in direction for the curves across the last three trials. One could logically argue that the present response patterns (including changes) would extend in their current directions across an additional 10 - 20 trials. Such an extension of trials would yield response curves for sex in which men continued on their present course, while women continued on the apparent downward trend (see Figure 3).
Figure 3. Response Acquisition Curves for Men and Women When Responding to Sexually Intimate Reinforcement

Similarly, in the emotionally intimate condition, women would continue on their present course, while men continued their apparent downward trend (see Figure 6).
Figure 6. Response Acquisition Curves for Men and Women When Responding to Emotionally Intimate Reinforcement

The resulting effect would be conceptually similar to a contrast effect in which men and women acquire the response equally - to a point. Once men realize that the material remains emotionally intimate, the reinforcing value is lost creating a rapid decrease in response speeds. Similarly, once women realize that the material remains sexually
intimate, reinforcing properties also dissipate causing rapid deceleration of the response.

A second methodological concern involves the number of men lost from the original data set due to not meeting the manipulation check requirements. Of the 19 women lost, percentages across both intimacy conditions were approximately equal (42.10% in sex vs. 57.90% in emotion). However, of the 23 men that were lost, nearly five times as many did not meet the manipulation check requirements in the sexually intimate condition (82.61% in sex vs. 17.39% in emotion). The disproportionate number of men lost from the sexually intimate condition indicates that many men experienced difficulty determining whether the material they receive was sexual or emotional in nature. This finding suggests one of two possibilities; either the sexually intimate material used in the current study may not have been as salient as had been anticipated, or, as mentioned above, men may have viewed the woman sender’s emotional communication as a prelude to sexual activity.

A somewhat related issue concerns the medium through which sexually and emotionally intimate verbal material was delivered. Although computers were used, men and women were still required to read the material from the computer
screen. Empirical evidence suggests, however, that men and women differ in the media that arouse them in pornography (e.g., Snitow, 1983) and sexual fantasies (e.g., Ellis & Symons, 1990). Men are typically more aroused by visual imagery (e.g., Knoth, Boyd, & Singer, 1988) including still and motion pictures. Women, on the other hand tend to prefer erotica that is in a readable format. Logically, the argument can be made that the use of verbal material in the present study may have been differentially affected by men’s and women’s proclivities for visual and verbal material.

Finally, the issue of statistical power must be addressed. Estimates of observed power for expected sex-differentiated acquisition were extremely low. Estimation of sample size during the development stages of the study was conducted by reviewing previous research studies that also employed an instrumental procedure (i.e., Cramer et al., 1989; Steigleder et al., 1978; Stich et al., 1987). Such research demonstrated that reliable differences among groups could be obtained using samples ranging from 13-25 participants per cell. The high end of this range was selected as the criterion cell sample size for the current study. The observed lack of statistical power suggests one
of three possibilities. First, cell sample sizes may have been too small. Second, the departure from linearity noted above may have affected power in a manner more serious than originally thought. Finally, the possibility exists that the effects sought in the current study are quite small, or nonexistent. Clearly, additional research extending an evolutionary perspective to existing sex differences concerning emotional and sexual intimacy is necessary.

Future Directions

Future attempts to empirically demonstrate sex-differentiated behavior in a manner consistent with the current study would be wise to address some of the methodological issues discussed above. On a conceptual level, increasing the intensity or saliency of the sexually intimate material seems imperative. However, the practical and theoretical issues involved in doing so must also be taken into consideration. Practically speaking, making the sexually intimate material more intense necessitates removing the gender-neutrality associated with the current material. Making the sexual material more intense also creates problems on a theoretical level, in that such an adjustment of the material is a sex-linked adjustment.
intended to increase male responding in the sexually intimate condition. The end effect of adjusting the material would, for the most part, result in an artificial increase of men’s response speeds to sexually intimate verbal material, while making no adjustment to the response speeds of women receiving sexually intimate messages, or to response speeds of men and women in the emotionally intimate condition.

Perhaps a more intuitively appealing adjustment to the current procedure involves changing the medium of the material to an auditory presentation. Although men and women have been shown to differ in their preferences for visual or verbal stimuli (e.g., Ellis & Symons, 1990; Knoth, Boyd, & Singer, 1988; Snitow, 1983), no such claim is made concerning auditory material. On a theoretical level, such a shift in procedure does not provide a differential advantage to one sex over the other.

Finally, as mentioned above, the need for more trials seems imperative. Rather than simply adding an additional 10-20 trials, future studies along these lines may consider actually incorporating a contrast effect design. Aside from the ability to show that emotionally and sexually intimate material are differentially reinforcing to women and men,
the use of a contrast design partially solves the problems with observed power in the current study. A true contrast design would require twice the number of participants as this study, which would provide a more accurate picture of the acquisition effects across the first half of the design before the contrast was initiated.

Conclusions

Although the current study was unable to extend an evolutionary perspective to behavioral differences in response to emotionally and sexually intimate verbal material, its scientific merit should not be dismissed out of hand. The goal of the current work was to integrate multiple levels of analysis in an attempt to clarify our understanding of a wealth of data examining sexual and emotional intimacy. In addition, the current work presented an empirical attempt to reconcile the notion of biologically constrained behavior with a perspective emphasizing evolved psychological mechanisms. Human behavior is inherently multifaceted. And, in order for a discipline that studies such behavior to progress scientifically, questions about their occurrence and causes must inherently involve multifaceted and integrative
approaches as well. The current work attempts to address such a question in hopes that others may be encouraged to do the same.
APPENDIX A

SELF-PERCEPTION QUESTIONNAIRE
Below are 29 statements that may or may not be characteristic of the way you see yourself as a person. Read each one carefully and rate whether the statement is characteristic or is uncharacteristic of you. Think about each statement carefully and answer each of the following items using the 9-point scale given below.

1. I'm always trying to figure myself out. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

2. I'm concerned about my style of doing things. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

3. Generally, I'm very aware about myself. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

4. It is important that my steady dating relationships include sexual activity. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

5. It takes me time to overcome my shyness in new situations. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

6. I reflect about myself a lot. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

7. I'm concerned about the way I present myself. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

8. Sex is the best part of intimate dating relationships. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

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9. I’m often the subject of my own fantasies. (Circle one)
   
   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

10. I have trouble working when someone is watching me. (Circle one)
    
   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

11. Being involved in an emotionally close dating relationship is very important to me. (Circle one)

   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

12. I constantly scrutinize myself. (Circle one)

   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

13. I get embarrassed very easily. (Circle one)

   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

14. I’m self-conscious about the way I look. (Circle one)

   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

15. I find it hard to talk to strangers. (Circle one)

   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

16. The best part of my intimate dating relationships is the emotional sharing and closeness. (Circle one)

   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |

17. I’m generally attentive to my inner-feelings. (Circle one)

   | I Strongly Disagree | 1 2 3 4 5 6 7 8 9 |
   | I Strongly Agree     | 1 2 3 4 5 6 7 8 9 |
18. I usually worry about making a good impression. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

19. I'm constantly examining my motives. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

20. I feel anxious when I speak in front of a large group. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

21. Being involved in a sexual relationship with someone is very important to me. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

22. On of the last things I do before I leave the house is look in the mirror. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

23. I sometimes have the feeling that I'm off somewhere watching myself. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

24. I'm concerned about what other people think of me. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

25. I'm alert to changes in my mood. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

26. It is important that my dating relationships include a great deal of emotional intimacy and sharing. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

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27. I'm usually aware of my appearance. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

28. I'm aware of the way my mind works when I work through a problem. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

29. Large groups make me nervous. (Circle one)

I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree
Please answer all of the following questions honestly. For the questions dealing with behavior, WRITE YOUR ANSWERS IN THE BLANK SPACES provided. For the questions dealing with thoughts and attitudes, CIRCLE the appropriate number on the scale provided.

1. With how many partners have you had sex (sexual intercourse) within the past year? 

2. How many different partners do you foresee yourself having sex with during the next 5 years? (Please give a specific, realistic numerical estimate)

3. With how many different partners have you had sex on one and only one occasion?

4. How often do (did) you fantasize about having sex with someone other than your current (most recent) dating partner? (Circle one)
   1. Never
   2. Once every two or three months
   3. Once a month
   4. Once every two weeks
   5. Once a week
   6. A few times each week
   7. Nearly every day
   8. At least once a day

5. Sex without love is OKAY. (Circle one)

   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

6. I can imagine myself being comfortable and enjoying “casual sex” with different partners. (Circle one)

   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

7. I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her. (Circle one)

   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree
APPENDIX B

SEXUALLY INTIMATE MESSAGES
1. It's great when a partner tells me that my body looks and feels fantastic.

2. This person is intelligent. (Agree or Disagree)

3. Incredible foreplay can begin by using some interesting toys.

4. Even if I was exhausted, I would “get going” if a partner started biting me gently.

5. Experimenting with rough sex, anal sex, or being tied-up is a fun way to find out what someone likes.

6. Trying different sexual positions is vital because not everyone “gets-off” the same way.

7. I would like to really arouse a partner at work by calling and talking dirty.

8. I would enjoy slowly kissing a partner from the top of the head to the tips of the toes.

9. Personally, I would like to have sex in a variety of private and public places.

10. This person is well-adjusted. (Agree or Disagree)

11. I would like to walk into the bedroom wearing nothing but Whipped Cream.

12. Nothing makes me hotter than when a partner gets things started.

13. Watching XXX rated movies in the afternoon can really jazz up the weekend.

14. Watching a partner put on a show for me by undressing slowly is a real turn-on.

15. This person is moral. (Agree or Disagree)

16. No matter if you are giving or getting it, oral sex is hard to beat.

17. I like this person. (Agree or Disagree)

18. Fulfilling a partner’s kinkiest sexual fantasies would really turn me on.

19. Showering with a partner and then sharing a sensual massage using warm scented oils is very relaxing.

20. It would be fantastic going to a club in disguise with a partner and “picking each other up” by flirting and seducing each other.
APPENDIX C

EMOTIONALLY INTIMATE MESSAGES
1. I would want to trust my partner with my deepest thoughts and feelings.

2. I feel at ease talking about people and events that have hurt me deeply.

3. This person is intelligent. (Agree or Disagree)

4. I would like to openly discuss significant problems with my partner.

5. That's interesting, but couples should always share and talk about their personal and career goals.

6. Yeah, I can easily think of situations where my partner and I would cry together.

7. This person is well-adjusted. (Agree or Disagree)

8. Personally, I am not afraid to let my guard down and show that I am vulnerable.

9. I agree, in a close relationship people should be able to communicate without saying anything.

10. Nothing would make me happier than knowing I am needed by someone.

11. My partner and I would openly express our needs to each other and for each other.

12. I would have no problem openly revealing my shortcomings and handicaps to my partner.

13. Open and honest communication is an essential part of a close relationship.

14. This person is moral. (Agree or Disagree)

15. I could only get closer to my partner by listening and sharing our personal problems.

16. I would share things I dislike about myself with someone I feel close to.

17. Not me, if my partner were upset I would feel comfortable showing that I care.

18. I like this person. (Agree or Disagree)

19. When trying to get emotionally close to someone, I am willing to risk being hurt.

20. I am at ease with discussing sad experiences with someone I care for.
APPENDIX D

INTERPERSONAL JUDGEMENT QUESTIONNAIRE
We are interested in knowing what impressions you may have formed about the person who sent the messages you just read. Please respond to each of the following statements about that person. Think about each statement carefully and then answer using the 9-point scale given below. Be sure to base your response on the messages you just read.

1. I believe that this person is very intelligent. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

2. I believe that this person is very knowledgeable about current events. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

3. This person impresses me as being very moral. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

4. I believe that this person is very well adjusted. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

5. I believe that this person places a high value on sexual intimacy in his/her romantic relationships. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

6. I feel I will probably like this person very much. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree

7. I feel I will like working with this person in an experiment very much. (Circle one)
   
   I Strongly Disagree 1 2 3 4 5 6 7 8 9 I Strongly Agree
8. I believe that this person is physically attractive. (Circle one)

I Strongly Disagree \[1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9\] I Strongly Agree

9. I believe that this person behaved appropriately. (Circle one)

I Strongly Disagree \[1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9\] I Strongly Agree

10. I believe that this person places a high value on emotional openness in his/her romantic relationships. (Circle one)

I Strongly Disagree \[1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9\] I Strongly Agree

11. Assuming that there is nothing to inhibit me, I would be interested in meeting this person. (Circle one)

I Strongly Disagree \[1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9\] I Strongly Agree

12. Assuming that there is nothing to inhibit me, I would be interested in dating this person. (Circle one)

I Strongly Disagree \[1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9\] I Strongly Agree

13. Assuming that there is nothing to inhibit me, I would be interested in pursuing a long-term romantic relationship with this person. (Circle one)

I Strongly Disagree \[1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9\] I Strongly Agree

14. The messages I read were useful in forming a first impression of the person who sent them. (Circle one)

I Strongly Disagree \[1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9\] I Strongly Agree
APPENDIX E

ONSCREEN INSTRUCTIONS
PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

First impressions are very important in men and women being attracted to each other. Most people see each other when the first impressions are formed. However, there has been a dramatic increase in the number of people going on to the Internet and meeting people on-line in chat rooms. Based on the personal and factual information exchanged while chatting on-line, some people form good impressions of each other and decide to meet in person. We are interested in studying the nature of these cyber impressions. That is, can someone like yourself form a useful first impression of another person of the opposite sex simply by reading messages found in a chat room.

PRESS THE SPACEBAR WHEN YOU HAVE FINISHED READING

PLEASE CONTINUE READING THE INSTRUCTIONS CAREFULLY.

In this experiment you will be asked to read some messages that our research team gathered while on-line. The messages will be presented in a chatroom-like format. Women will receive messages from only one man and men will receive messages from only one woman. While receiving the messages, you will be asked periodically through the computer to answer some questions concerning both the specific content of the messages, as well as, your perception of the person who sent the messages. After reading all the messages you will be asked to answer some general questions concerning any impressions you formed about the person who sent the messages, and about how those impressions effect your attitudes toward that person. In addition, you will be asked by the experimenter to verbally answer some questions concerning the specific content of the messages you received. Please read each message carefully.

PRESS THE SPACEBAR WHEN YOU HAVE FINISHED READING

PLEASE CONTINUE READING THE INSTRUCTIONS CAREFULLY.

In order to give you time to read each message carefully and form clear impressions about the person sending the message, the experiment follows a standard procedure. First, you will be instructed to: Press the SPACEBAR to read new message. After pressing the SPACEBAR, the message will be displayed on the computer screen. Do not worry about being unable to read the messages. Each message or evaluation request will remain onscreen long enough for you to read and think about each message. Please read each message carefully. As you receive new messages the sequence will be repeated. The experiment follows this standard sequence until all of the messages have been displayed and read.

PRESS THE SPACEBAR WHEN YOU HAVE FINISHED READING
PLEASE CONTINUE READING THE INSTRUCTIONS CAREFULLY

Periodically, you will be asked to give your current impression of the person sending the messages. A statement will appear on the screen describing the person sending the messages. Use the scale attached to the clipboard next to the computer to indicate your level of agreement with the description. Use a new scale, numbered 1-6, each time you are asked to indicate your level of agreement.

PRESS THE SPACEBAR WHEN YOU HAVE FINISHED READING

PLEASE CONTINUE READING THE INSTRUCTIONS CAREFULLY

After reading all of the messages the first phase of the experiment is completed. In the second phase of the experiment you will be given a questionnaire designed to measure your impressions of and attitudes toward the person who sent the messages. If you have any questions please ask them now.

WHEN YOU ARE READY TO BEGIN THE EXPERIMENT PRESS THE SPACEBAR
APPENDIX F

INFORMED CONSENT FORM
This study is being conducted by Todd Abraham under the supervision of Professor Robert Cramer, Department of Psychology. In this study you will be asked to read some messages that were found while on-line in different chatrooms. After reading the messages you will be asked to answer some general questions about the person who sent the messages. The research is designed to study the type of personal impressions that may form from interactions in an Internet chatroom. Because the Internet is an unregulated environment, it is possible that you could be reading messages that include emotionally expressive or sexually explicit information. This study has been approved by the Department of Psychology Human Subject Review Board, California State University, San Bernardino.

The experiment involves completing several questionnaires and reading computerized messages, which should take about 45 minutes to complete.

Any information you provide will be held in strict confidence. At no time will your name be reported along with your responses. All data will be reported in group form only. At the study's conclusion you may receive a report of the results. Results should be available by the start of classes in the Fall of 2001.

There are no foreseeable risks to you for participating in the study. At your instructor's discretion you may receive extra credit for your participation.

If you have any questions regarding this study or if you would like a report of the results, please contact Professor Robert Cramer at (909) 880-5576.

Your participation in this research is voluntary. You are free to withdraw, without penalty, or remove any data you have provided, at any time during this study.

By placing a mark in the space below, I acknowledge that I have been informed of, and understand, the nature and purpose of this study, and freely consent to participate. By this mark I further acknowledge that I am at least 18 years of age.

Give your consent to participate by marking an "X" here ____

Today's date is ________________________________
APPENDIX G

DEBRIEFING FORM
This research was designed to study the type of personal impressions that may form when men and women share sexual and emotional intimacies. In order to conduct this study a small deception was necessary. The messages were not downloaded from the Internet. Rather, they were developed by our research group from information provided by other undergraduate students.

All responses will be analyzed in group form in order to insure the complete anonymity of your responses. At no time will your responses be linked to you specifically.

If you have any questions regarding this study or if you would like to obtain the results, please contact Professor Robert Cramer at (909) 880-5576. Results should be available by the start of classes in the Fall of 2001.

For methodological purposes, please do not discuss the nature of this study with other potential participants. Doing so can invalidate the results of the study.

Your participation is greatly appreciated.
REFERENCES


Sprecher, S. (1989). The importance to males and females of physical attractiveness, earning potential, and expressiveness in initial attraction. Sex Roles, 21, 591-607.


