

## THE IMPACT OF SEXUAL HISTORY AND DESIRED RELATIONSHIP DURATION ON EVALUATIONS OF ATTRACTIVENESS AND RECALL

LORIANN WILLIAMS<sup>1</sup>, MARYANNE FISHER<sup>1\*</sup>, ANTHONY COX<sup>2</sup>

<sup>1</sup>Saint Mary's University

<sup>2</sup>Dalhousie University

**Abstract.** Although there exists a plethora of studies on the determinants and consequences of facial attractiveness, there exists little research on how within-individual evaluations of facial attractiveness are impacted by knowledge of a person's sexual history and the duration of the relationship they seek. Using a pre-post design, participants rated individual faces for attractiveness, and then re-evaluated the faces accompanied by a fictitious online dating advertisement, manipulated for the models' sexual history and desired relationship duration. We found that women, more than men, were impacted by this knowledge and that desired relationship duration influences the direction of change while sexual history influences the significance of the effect. One week later, participants were presented with the same faces and asked to recall the prior information. Participants recalled more information for sexual history than for desired relationship duration with an overall mean accuracy of 64.4%. These findings are discussed using the conceptual framework offered by evolutionary psychology, particularly mate selection theory.

**Keywords:** sex differences, facial attractiveness, memory, sexual experience, romantic relationships

Evolutionary psychology provides a framework in which to explain sex-based differences in mating preferences. One aspect of evolutionary theory, sexual selection, suggests that mating strategies are solutions to sex-specific adaptive problems (BUSS and SCHMITT 1993). Women and men must confront distinct adaptive problems, such as how to allocate their time and effort with respect to

---

\* Corresponding author: MARYANNE FISHER, Department of Psychology, Saint Mary's University, 923 Robie Street, Halifax, Nova Scotia, B3H 3C3, Canada. Telephone: +1 (902) 491 6275, E-mail [mlfisher@smu.ca](mailto:mlfisher@smu.ca)

acquiring mates, and consequently, exhibit differences in mate preferences stemming from parental investment (BUSS 1998; SYMONS 1979; TRIVERS 1972).

To clarify, men may maximize their reproductive success through sexual activity with as many women as possible, primarily engaging in short-term, non-committal sexual relationships, and investing minimally in any resulting children (SYMONS 1979). It is theorized that men will prefer brief interactions, and consequently, they should attend to characteristics signaling reproductive potential, particularly, physical attractiveness (BUSS 1998). Alternatively, women typically provide support to their children through mechanisms such as lactation and post-natal care. Hence, they must locate mates who will assist and sustain them while they provide long-term child support. Women could, therefore, maximize their reproductive success by relying on long-term mating strategies (BUSS and SCHMITT 1993) and obtaining a commitment of support and resources from men (SYMONS 1979). Thus, a widely held view is that women are more attentive to a partner's characteristics related to resource acquisition, such as wealth, status, and dominance (BUSS 1991).

As will be reviewed in the following section, physical attractiveness, sexual experience, relationship status, and one's desire to commit to a relationship are factors that have been investigated with respect to one's desirability as a potential mate (MADEY et al. 1996). Moreover, mate preferences as they relate to single, married, and casual dating scenarios by participant sex have been well studied (SPRECHER et al. 1997). In this article, we extend and integrate previous research by examining the impact of potential partners' sexual history and their desired relationship duration on evaluations of attractiveness. Furthermore, we investigate whether these variables influence long-term memory and one's ability to recall, based on facial recognition, the sexual history and desired relationship duration of potential partners.

We hypothesize that because men invest less in mating activities and consequently have a greater number of opportunities to reproduce, they will focus on their partner's genetic quality, as identified by attractiveness, and will not be greatly influenced by factors such as their partner's sexual history. In contrast, we hypothesize that women, who must provide long-term child care, who need support while providing this care, and who have fewer reproductive opportunities, will be influenced by men's potential to support them and provide paternal care. We suggest that, in particular, women desire men seeking long-term relationships and who have minimal sexual experience, potentially indicating they have no existing children on which they currently expend their resources. Relevant research on mating preferences is next reviewed in order to establish a foundation for these hypotheses.

## SEX DIFFERENCES IN MATING PREFERENCES

Relative to other interpersonal characteristics, attractiveness is the first, and sometimes only, basis on which to form interpersonal evaluations (BERSCHEID and WALSTER 1974). Initial attractiveness judgments may influence evaluations of other characteristics. For example, attractive individuals are perceived to have desirable personalities, happy marriages, and high employment success (DION, BERSCHEID and WALSTER 1972). Both men and women express a preference for, and desire to form relationships with, attractive people (BERSCHEID and WALSTER 1974). Individuals who are considered attractive are more desired as romantic partners (BERSCHEID et al. 1971), and are more likely to have extramarital affairs than less attractive individuals (DERMER and THIEL 1975).

In terms of mate selection, this preference for physically attractive mates is not surprising because attractiveness is believed to signal factors such as fertility (BUSS 1989), health (DIXSON et al. 2003; GEARY 2005; SHACKELFORD and LARSEN 1999), and gene quality (THORNHILL and GANGESTAD 1993; ZEBROWITZ and RHODES 2004). Due to the link between attractiveness and these characteristics, attending to a potential mate's attractiveness is advantageous for both women and men.

However, as men's physiological contribution to reproduction ends upon the completion of copulation, men may engage in many mating attempts and invest minimally in each attempt (TRIVERS 1972). Since no long-term investment is necessary, men need only focus on the fertility and genetic quality of their partner to ensure that mating is successful and that their genes are paired with those of high quality. Support for this view is offered by BUSS (1989), who found that, cross-culturally, men express a preference for youthful and fecund (i.e., attractive) women. By preferring youthful mates, men potentially increase their reproductive success because these women may more reliably and more easily bear them children than older women. Consequently, evolutionary theory suggests that it is not necessary for men to heavily scrutinize the characteristics of potential mates, aside from indicators of fertility and genetic quality. Physical attractiveness serves as a key indicator for these traits because a woman's reproductive value is readily assessed visually on the basis of proximate cues to age and health (SYMONS 1979). Furthermore, although cultural standards for physical attractiveness vary and may fluctuate over time, facial attractiveness measures are quite stable cross-culturally (CUNNINGHAM et al. 1995). This cross-cultural stability may be due to the fact that attractiveness affects mate choice because it is correlated with factors, such as gene quality, as previously mentioned. Thus, in this paper we focus on the evaluation of facial attractiveness to avoid any cultural effects and because of the adaptiveness of attending to individuals' attractiveness.

Compared to women, men require less time in a relationship to consent to sexual activity (BUSS and SCHMITT 1993) and are more willing to accept an offer of sex from a stranger (CLARKE and HATFIELD 1989; VORACEK, HOFHANSL and

FISHER 2005), even if they are in a relationship (ELLIS and SYMONS 1990). According to BUSS and SCHMITT (1993), both men and women possess psychological adaptations for short-term mating, such as occasionally engaging in extra-pair mating to increase reproductive output (men) or to secure better genes from an alternate mate (women). However, men may possess three additional adaptations that suggest they are generally more oriented toward short-term mating than women: men possess greater desire for short-term sexual relationships, men prefer larger numbers of sexual partners over time, and men require less time before consenting to sex (SCHMITT, SHACKELFORD and BUSS 2001). Thus, there is ample evidence that men strive to maximize their number of reproductive opportunities and thus causing immediately ascertainable indicators of fertility and gene quality (e.g., attractiveness) to be of considerable importance to men.

It is important to note that there are extraneous and confounding variables that may affect evaluations of attractiveness, such as one's current romantic relationship status (i.e., whether someone is currently romantically involved or not). MADEY et al. (1996) interviewed university students at a nightclub regarding their relationship status, and then asked them to rate the attractiveness of opposite-sex patrons at the bar. At closing time, those not in a relationship rated opposite-sex patrons as significantly more attractive than did those in a relationship, indicating that relationship status can influence ratings of attractiveness.

The hypothesis that both facial and bodily physical attractiveness in humans are certifications of developmental and hormonal health has been supported (THORNHILL and GRAMMER 1999). Such evidence indicates that physical attractiveness is a signal of phenotypic and genetic quality, which, in turn, may indicate mate value (THORNHILL and GRAMMER 1999). Furthermore, SYMONS (1979) suggests that sexual selection theory indicates that men pay more attention to attractiveness than do women. Consequently, due to its importance, we believe that men's judgment of attractiveness will be stable and independent of other factors, such as the form of a relationship a potential mate seeks, or her sexual history.

In contrast with male preferences, TRIVERS (1972) espouses that women should consider men's ability to acquire and retain resources as the most important characteristic in prospective mates. Women have significant limitations on the number of children they can bear and are frequently solely responsible for the survival of these offspring. Thus, women will benefit from access to men's resources, and consequently prefer men who express an ability and a willingness to invest resources, time, and protection towards the woman and her offspring (e.g., BUSS 1989).

While women should primarily seek long-term relationships, it should be noted that women may also benefit from engaging in short-term sexual relationships, even when in long-term relationships. GANGESTAD and SIMPSON (2000) proposed that short-term mating or extra-pair copulations may allow women to secure additional resources for themselves and their children. Also, mating with

physically attractive men may secure better genes for their children (GEARY 2005). However, while these benefits exist, a woman who is indiscriminate in her mating activities may risk disease acquisition, violence from partners, unwanted pregnancy, loss of secured resources, and a perception of reduced value from her long-term mate (OKAMI and SHACKELFORD 2001). Thus, although women may engage in short-term relationships, they probably do so less often than men.

BUSS (1992) theorized that because male fertility remains high throughout the life-span and cannot be accurately assessed through physical appearance, there is no adaptive reason for women to be overly interested in male attractiveness. Other researchers agree; GANGESTAD (1993) stated, "women probably evolved to prefer mates who, all else being equal, possess what we might refer to as investment potential" (p. 206). Regardless of the importance that women place on male attractiveness, it should be noted that the female judgment process may be significantly different than that used by males. GRAZIANO et al. (1993) proposed that women's judgments of male attractiveness may be more complicated and less direct than men's judgments of female attractiveness. For example, whereas "large eyes" are a reliable indicator of female attractiveness to men, women may be responsive to not only the physical appearance of potential mates, but also behavioral characteristics such as pro-social behavior or traits that would maximize the survivability of offspring. Similarly, ELLIS (1992) conjectured that male attractiveness is composed of status signals, indicators of social dominance, and a willingness to invest in offspring. Together, these cues may result in a male being perceived as very attractive.

Another view is held by WAYNFORTH (2001), who suggested that women "trade-off" men's attractiveness and resources. He proposed that women are willing to select attractive men with few resources, or unattractive men with plentiful resources, thus leading to a trade-off between attractiveness and resourcefulness. To make such a trade-off, it is necessary for women to ascertain a potential mate's resource level and to not make decisions solely using attractiveness. Thus, WAYNFORTH (2001) provides support for our view that women may be influenced by attributes other than attractiveness when evaluating a potential mate.

Although these preferences exist, it is crucial to note that they are flexible and can change according to the duration of a desired relationship. For example, REGAN and JOSHI (2003) asked adolescents to indicate their preferences for various characteristics for short-term (primarily sexual) and long-term (primarily romantic) partners. They discovered that both sexes expressed a preference for attractiveness in casual sex partners, whereas they sought intelligence and other personality characteristics, such as humor, in long-term, romantic mates. Similarly, KENRICK et al. (1993) asked adults their mate preferences when seeking one-night stands, sexual relationships (defined as low committedness with unspecified relationship duration), steady dating relationships, and marriage. Their findings indicated that women most preferred attractiveness when considering a one-night stand, whereas men most preferred attractiveness for a primarily sexual relationship. Likewise,

women and men placed more importance on status when seeking a steady dating or marital partner than when seeking a partner for sexual relations.

Given women's tendency to seek longer-term relationships to ensure access to needed resources, their tendency to place more importance on status than physical attractiveness is appropriate. Females' reproductive success is not as closely related to finding fertile mates as males' reproductive success, but rather to finding a mate who is willing and able to provide resources related to parental investment in offspring (e.g., food, shelter, territory), as well as protection (BUSS 1989; TRIVERS 1972). For this reason, it is likely that women, more than men, are influenced by a potential partner's desired relationship duration and sexual history (i.e., experience). Men with extensive sexual histories may be indirectly signaling that they tend to not invest in long-term relationships, and thereby permitting sexual history to serve as a proxy signal of paternal investment potential. Hence, women should attend more to a mate's sexual history than men. In contrast, men should be primarily interested in female attractiveness, and attend less to sexual history or the duration of the relationship they are seeking.

### CURRENT STUDY

The goal of our research is to extend prior findings by investigating the influence of an individual's sexual history and desired future relationship duration on others' evaluations of their facial attractiveness. The effect of the rater's *current* relationship status on perceived attractiveness has been previously studied (O'HAGEN et al. 2003); however, the effect of a potential partner's *desired* future relationship duration has not been examined with respect to its effects on ratings of attractiveness. Furthermore, sexual history has not been empirically examined in relation to facial attractiveness judgments.

Our study attempts to demonstrate that men's ratings of attractiveness are relatively consistent and are not significantly affected by women's desired relationship duration or sexual history. Therefore, we hypothesize:

*Hypothesis 1:* Men's ratings of facial attractiveness are relatively consistent, and are affected less than women's by a potential partner's sexual history and desired relationship duration.

Conversely, for women, it is likely that men seeking long-term relationships and who have minimal sexual experience are more desirable partners than experienced men seeking short-term relationships given that these attributes signal the possibility of paternal investment. Thus, women's attractiveness ratings will be more impacted, than men's, by a potential partner's desired relationship duration and sexual history. Consequently, we hypothesize:

*Hypothesis 2a:* Women will increase their rating of facial attractiveness for men desiring a long-term relationship and who have little sexual experience.

*Hypothesis 2b:* Women will decrease their rating of facial attractiveness for men desiring a short-term relationship and who have much sexual experience.

We further contend that people should remember information that is important to their reproductive success. Sexual history provides a record of a person's past relationship activities, indirectly suggests the level of commitment they seek prior to sexual relations, and signals their potential for carrying sexually transmitted diseases. In contrast, desired relationship duration indicates their future relationship intentions, which may or may not occur, given that a single individual does not have complete control of a relationship. Due to these differences, and because one's past behavior is the best predictor of their future behavior (CONNER and ARMITAGE 1998), sexual history may be more informative than the intention expressed by desired relationship duration. Thus:

*Hypothesis 3a:* More information will be recalled about sexual history than about desired relationship duration.

*Hypothesis 3b:* Information recalled about sexual history will be more accurate than information recalled about desired relationship duration.

## METHODS

### Participants

Participants consisted of 27 men (age  $M = 20.59$  years,  $SD = 2.08$ ) and 24 women (age  $M = 21.17$  years,  $SD = 3.42$ ), all of whom had a self-reported heterosexual orientation. All participants attended Saint Mary's University and were recruited through the Department of Psychology's undergraduate participant pool. Students participated in the two sessions of the study to receive a small course credit in a psychology class of their choosing; 29% had declared Psychology as their major area of study. Seven women and 13 men stated that they were currently single or dating casually, and 17 women and 13 men stated that they were dating one person steadily. No participant was married, engaged, or divorced.

### Stimuli

Photographs of 12 average-looking female and 12 average-looking male faces were used to generate attractiveness ratings. Averageness was determined using baseline data from a previous study that relied on a larger sample taken from the same photographic dataset. The images from the previous study were portioned into three groups according to whether they were of low, average, or high attractiveness, and

those in the middle third were used in the current study. These photographs were of individuals in an introductory psychology class at a university in Toronto and were taken several years prior to the present study (GELDART, MAURER and HENDERSON 1999). All individuals in the photographs displayed a neutral facial expression, wore the same black smock, and were not wearing any accessories.

The first session of the study dealt with attractiveness evaluations and was broken down into two phases (first phase: facial attractiveness rating; second phase: facial attractiveness rating with vignette). The first phase used four binders containing different, randomly generated orderings of the 24 photographs. In the second phase, the same photographs were used as in the first phase, only this time each photograph appeared as if it were part of a dating service (called the Hugsland Dating Co.) with individuals advertising themselves to potential mates. A fictional dating service was used to increase the realism of context, as participants might feel like they were rating the attractiveness of potential partners. Each advertisement consisted of a photograph of the fictional person, as well as fictional demographic information such as the person's name (generated by choosing first and last names from random pages of the local phonebook), their age (all were between the ages of 20 and 23), sex, and hometown (all were from Halifax, the study location). The advertisement then included a two-line account of the model's sexual history (i.e., whether they had much or little sexual experience) as well as the desired duration of the relationship that they were seeking (i.e., short-term or long-term). All were identified as being single and seeking a relationship with a member of the opposite sex.

The vignettes associated with the photographs were approximately the same length and manipulated for content, such that each vignette reflected one of the four conditions of sexual history and desired future relationship duration: much sexual experience, seeking a short-term relationship; much sexual experience, seeking a long-term relationship; little sexual experience, seeking a short-term relationship; and little sexual experience, seeking a long-term relationship. All statements used in the vignettes were piloted on 15 participants, both men and women, prior to the study to confirm that they were clearly members of the intended condition.

Between the two phases of the first session (facial attractiveness rating without vignette and facial attractiveness rating with vignette), participants were asked to complete a brief demographics survey and then perform a distracter task. To provide time for participants to "forget" the faces they saw in the first session, they played a visually stimulating game, "I Spy," (SCHOLASTIC 2005). In the game, the participant selects one of eight game boards, showing hundreds of objects, and draws a card from a previously shuffled stack. On the card, there are eight objects shown; only one of which appears on the specific game board the participant has selected. The goal is to find, as quickly as possible, the object on the card that also exists on the game board.

The second session of the study, performed one week later, is referred to as the study's *remembrance* component. This session used the same 24 photographs from

session one (without vignettes), as well as 11 additional distracter photographs, consisting of both male and female photographs taken from the same data set and that the participants had not seen previously. All photographs were laid out in a random  $5 \times 7$  grid for the second session.

### Procedure

For both sessions, each participant was tested one-on-one in a private laboratory. After providing consent, participants were randomly given a binder containing the 24 photographs. Participants were provided with a response sheet and verbally instructed to rate each photograph using a 7-point Likert-type scale (1 = *extremely unattractive* to 7 = *extremely attractive*). Participants viewed and rated each of the 24 photographs at their own pace with no imposed time limits. The participants then completed the demographics survey and played "I Spy" according to the rules provided with the game for at least five minutes.

In the second phase of the first session, following the distracter task, participants again viewed the photographs (in a different order), but this time the photographs were in the previously described Hugsland Dating Co. binder. Participants were instructed to read the vignette and then to rate the attractiveness of the face in the photograph, using a second response sheet. When they were finished, they were asked if they would like to participate in a different study on attractiveness that would take place in one week; no further details about the study were provided.

Participants returned one week later to complete the second (remembrance) session of the study. The choice of a one week interval matches that of BARCLAY and LALUMIERE (2006) who found a one-week test-retest correlation,  $r = 0.60$  ( $p < 0.001$ ), for remembered information. In the second session, after providing consent, the participants viewed the 24 faces seen the week before, as well as an additional 11 distracter faces. The participants were instructed to tell the experimenter which faces they remembered and what information they could recall. This data was recorded on paper by the researcher as it was recalled by the participant. The participants were then thanked for their time and debriefed.

The remembered information was coded using the measures of precision and recall, as defined for computational information retrieval (BAEZA-YATES and RIBEIRO-NETO 1999). Both precision and recall range from 0 to 1.0 and represent percentages. Precision, alternatively known as accuracy or correctness, identifies the percentage of a participant's responses that are correct. Retrieval, alternatively known as completeness, identifies the percentage of possible responses that were correctly remembered by the participant. Precision and recall values were generated for each type of information (i.e., sexual history and desired relationship duration) as well as for an aggregate combining both information types.

## RESULTS

### Changes in Attractiveness Ratings

A pre-post study design was used, such that attractiveness ratings provided in phase one were subtracted from those in phase two, leading to a difference value. The mean of these differences was calculated for each condition and used as the dependent variable. This design permitted a repeated measures Analysis of Variance (ANOVA) to be performed, with the within-subjects variables being the three conditions with two levels each (little vs. much sexual experience; short vs. long duration relationships; and female vs. male faces). The between-subjects factor was the sex of the participant.

There was no significant main effect for the sex of the participant,  $F(1,49) = .63, p > .05$ . Furthermore, the sex of the participant did not significantly interact with the sex of the faces,  $F(1,49) = .26, p > .05$ . However, there was a significant main effect for sexual history,  $F(1,49) = 17.37, p < .000$ . The faces of individuals with much sexual experience decreased ( $M = -.90, SD = 2.22$ ), as compared with those with minimal sexual experience ( $M = .27, SD = 1.37$ ). As well, there was a significant main effect for relationship duration,  $F(1,49) = 28.30, p < .000$ . Attractiveness evaluations of those seeking long-term relationships increased ( $M = .35, SD = 1.77$ ) and those seeking short-term relationships decreased ( $M = -.99, SD = 1.81$ ).

There was a significant interaction between the sex of the participant and sexual history,  $F(1,49) = 4.79, p = .03$ . Women's ratings significantly decreased when the model was said to have much sexual experience ( $M = -.78, SD = 3.34$ ) and increased compared to little sexual experience ( $M = 1.39, SD = 2.56$ ; paired-samples  $t(23) = 4.04, p = .001$ ). This trend also held for men (much experience  $M = -.006, SD = 3.14$ ; little experience  $M = .64, SD = 2.57$ ) but was not significant,  $t(26) = 1.56, p > .05$ . We then created a one-way ANOVA with the sex of the participant as the independent variable and sexual history as the dependent variable. This model revealed no significant interaction; women and men were equivalently influenced by those with much sexual experience,  $F(1,49) = 2.49, p > .05$ , and by those with minimal sexual experience,  $F(1,49) = .59, p > .05$ . Thus, there is a significant shift in ratings for women only, as compared to initial attractiveness evaluations, due to sexual history. However, the direction of the change and its magnitude are consistent across participant sex.

Another significant interaction occurred for the sex of the participant and desired relationship duration,  $F(1,49) = 6.03, p = .02$ . Both women's (short-term:  $M = -1.50, SD = 1.95$ ; long-term:  $M = .51, SD = 1.73$ ;  $t(23) = 4.65, p < .000$ ) and men's (short-term:  $M = -.53, SD = 1.57$ ; long term:  $M = .21, SD = 1.82$ ;  $t(26) = 2.46, p = .02$ ) evaluations decreased when the models were seeking short-term as opposed to long-term relationships. However, a one-way ANOVA with participant

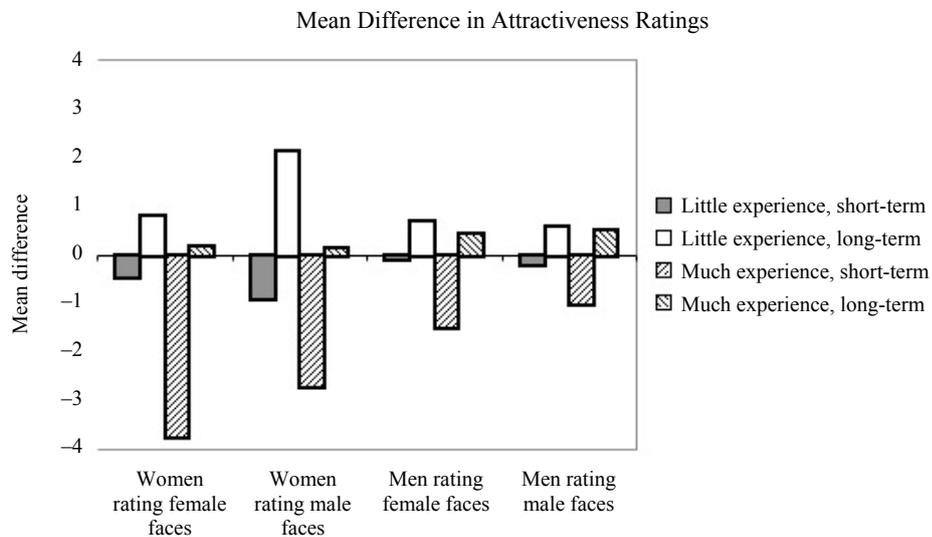
sex as the independent variable and the desired relationship duration as the dependent variable reveals that women and men are affected differently by learning someone is seeking a short-term relationship,  $F(1,49) = 3.87, p = .05$ . There was no significant difference for the long-term relationship condition,  $F(1,49) = .36, p > .05$ . Thus, both women's and men's ratings change by learning about someone's desired relationship duration, but the change in women's ratings is larger than men's.

Also, there was a significant interaction between the sex of the face and desired relationship length,  $F(1,49) = 6.25, p = .02$ . Compared to their initial ratings, female models' ratings significantly decreased when they were thought to be seeking a short-term relationship ( $M = -1.35, SD = 2.60$ ) versus long-term relationship ( $M = .75, SD = 1.97$ ),  $t(24) = 4.42, p < .000$ . This pattern was not significant for male models; compared to the initial ratings, ratings of models seeking a short-term relationship ( $M = -.62, SD = 1.76$ ) did not significantly decrease compared to those seeking a long-term relationship, ( $M = .05, SD = 2.45$ ),  $t(50) = 1.62, p > .05$ .

There was a significant interaction between sexual history and relationship duration,  $F(1,49) = 11.21, p = .002$ . There was a large, significant decrease for faces of those with much sexual experience seeking short ( $M = -2.04, SD = 3.17$ ) versus long ( $M = .24, SD = 2.39$ ) term relationships,  $t(50) = 4.74, p < .000$ . There was also a significantly larger decrease for those seeking a short-term relationship with much ( $M = -2.04, SD = 3.17$ ) compared to little ( $M = .07, SD = 1.48$ ),  $t(50) = 4.46, p < .000$  sexual experience. A third significant difference was found for faces of those seeking a short-term relationship with much sexual experience ( $M = -2.04, SD = 3.17$ ) as compared to those seeking a long-term relationship with little sexual experience ( $M = .47, SD = 1.95$ ),  $t(50) = 6.25, p < .000$ .

A significant three-way interaction occurred for the sex of the face, desired relationship duration, and sexual history,  $F(1,49) = 1.78, p = .05$ . Remembering that the value that is used as the dependent represents the change in the pre-post rating, due to the information in the vignette, paired-samples *t*-tests revealed 14 significant comparisons. Female faces of those with much sexual experience and seeking a short-term relationship were rated significantly differently than those seeking a long-term relationship,  $t(50) = 3.91, p < .000$ ; differently than females with little sexual experience also seeking a short-term relationship,  $t(50) = 2.84, p = .005$ ; than females with little sexual experience seeking a long-term relationship,  $t(50) = 5.04, p < .000$ ; than males with much sexual experience seeking a long-term relationship,  $t(50) = 3.86, p < .000$ ; and than males with little sexual experience seeking a short-term relationship,  $t(50) = 4.18, p < .000$ . Male faces of those with much sexual experience and who were seeking a short-term relationship were rated significantly different than females with much sexual experience seeking a long-term relationship,  $t(50) = 3.96, p < .000$ ; than females with little sexual experience seeking a short-term relationship,  $t(50) = 2.79, p = .007$ ; than females with little sexual experience seeking a long-term relationship,  $t(50) = 5.59, p < .000$ ; than

males with much sexual experience seeking a long-term relationship,  $t(50) = 3.94, p < .000$ ; than males with much sexual experience seeking a short-term relationship,  $t(50) = 4.20, p < .000$ ; and than males with little sexual experience seeking a short-term relationship,  $t(50) = 3.98, p < .000$ . Female faces of those with much sexual experience and who were seeking a long-term relationship were rated significantly different than females with minimal experience seeking a long-term relationship,  $t(50) = 2.07, p = .04$ . Female faces of those with little sexual experience and who were seeking a short-term relationship were rated significantly different than females with little sexual experience and seeking a long-term relationship,  $t(50) = 2.95, p = .005$ . No other comparison yielded significant findings at the  $\alpha = .05$  level (see *Figure 1*).



*Figure 1.* Mean difference in attractiveness ratings by participants for female and male faces displaying different levels of sexual experience and desired future relationship duration

### Precision and Recall of Information

Precision was calculated as the number of correct statements (for either desired relationship duration or sexual history) divided by the total number of applicable statements provided, yielding a score between 0 and 1.0. Recall was calculated as the number of correct statements (for either desired relationship duration or sexual history) divided by the total number of possible correct statements, also yielding a score between 0 and 1.0. For example, if a participant correctly states that a particular face belonged to someone who was seeking a long-term relationship but makes no statement about sexual experience, the participant has a total precision of

1.0 (i.e., everything stated is correct) and a total recall of .5 (i.e., half of the possible information was remembered). For desired relationship duration alone, the participant has a precision of 1.0 and a recall of 1.0. For sexual experience alone, the precision and recall are both 0, but these values are somewhat misleading as they are based on the fact that the participant did not respond, and not on the fact that the participant responded incorrectly. Thus, we code “no response” differently from an “incorrect response,” and do not calculate precision when there is no response. That is, when precision is considered as the correctness of the participant, we do not calculate a correctness score of 0 when the participant does not attempt an item to avoid being incorrect. However, for recall, we do calculate a score of 0 for a missing response since recall measures the completeness of a participant’s responses and a missing response is certainly an incomplete one. Furthermore, as there was no possible recallable information about the distracter faces, they were only used in the calculation of precision for variables that spanned more than a single condition (i.e., collapsed data) because it is impossible to calculate precision and recall for non-existent information. That is, as there are no correct responses for a distracter face, information participants provide about these faces cannot affect recall, but may lower the precision.

Paired-samples *t*-tests revealed that participants had higher precision for sexual history ( $M = .72, SD = .19$ ) than for relationship duration ( $M = .57, SD = .23$ ),  $t(50) = 3.98, p < .000$ , and higher recall for sexual history ( $M = .26, SD = .18$ ) than for relationship duration ( $M = .17, SD = .13$ ),  $t(50) = 5.53, p < .000$ . In general, participants recalled 21.53% ( $SD = 14.26$ ) of all possible desired relationship duration and sexual history information one week later, with a mean precision of 64.40% ( $SD = 15.43$ ).

### **Precision of Relationship Duration and Sexual History**

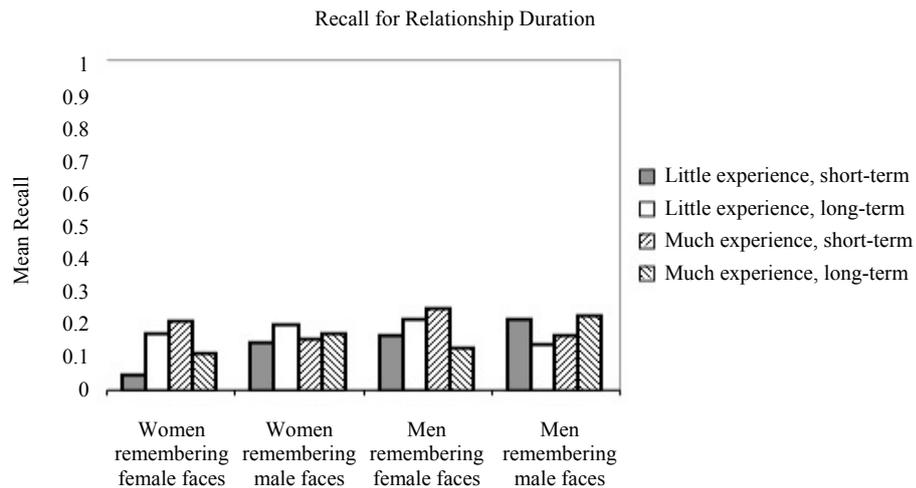
Given the highly variable nature of people’s remembrances, and the associated varying degrees of freedom and decreased sample size within each condition, precision could only be explored using paired-samples *t*-tests to examine one variable at a time, and collapsing across the remaining factors. That is, for many participants, no precision was calculable for some subset of conditions as no information was remembered for which the accuracy could be ascertained. As previously stated, we did not want to artificially lower precision when participants did not respond, as a lack of response may indicate that one is attempting to be correct by avoiding incorrectness. There was no significant difference in precision for remembrance of those seeking short ( $M = .68, SD = .18$ ) versus long ( $M = .66, SD = .24$ ) term relationships,  $t(50) = .33, p > .05$ . There was also no significant difference in precision for male ( $M = .65, SD = .20$ ) versus female ( $M = .64, SD = .24$ ) faces,  $t(50) = .15, p > .05$ . However, there was a significant difference for precision in remembering sexual history; those with much experience were

remembered more accurately than those with little experience,  $t(50) = 3.31, p = .002$ . For female participants only, the effect remained (much experience:  $M = .73, SD = .23$ ; little experience:  $M = .53, SD = .29$ ),  $t(23) = 2.35, p = .03$ , as well as for male participants only (much experience  $M = .73, SD = .15$ ; little experience  $M = .60, SD = .28$ ),  $t(26) = 2.37, p = .03$ .

### Recall of Relationship Duration and Sexual History

To examine recall of desired relationship duration and sexual history, we constructed a repeated-measures ANOVA, with the between-subjects variable the sex of participant, and the within-subjects variables the sex of the face, sexual history, and desired relationship duration.

There was a main effect for recall by the sex of the face,  $F(1,49) = 8.03, p = .007$ . Participants had higher rates of recall for male faces ( $M = .24, SD = .22$ ) than for female faces ( $M = .19, SD = .18$ ). There was not a significant main effect due to participant sex,  $F(1,49) = 2.36, p > .05$ , nor for relationship duration,  $F(1,49) = .31, p > .05$  (see *Figure 2*).



*Figure 2.* Mean recall of remembered information on desired relationship duration by participants for female and male faces displaying different levels of sexual experience and desired future relationship duration

However, there was a significant main effect for sexual history,  $F(1,49) = 38.98, p < .000$ . Models with much sexual experience ( $M = .26, SD = .20$ ) had their sexual history recalled at higher rates than those with little sexual experience ( $M = .17, SD = .20$ ) (see *Figure 3*).

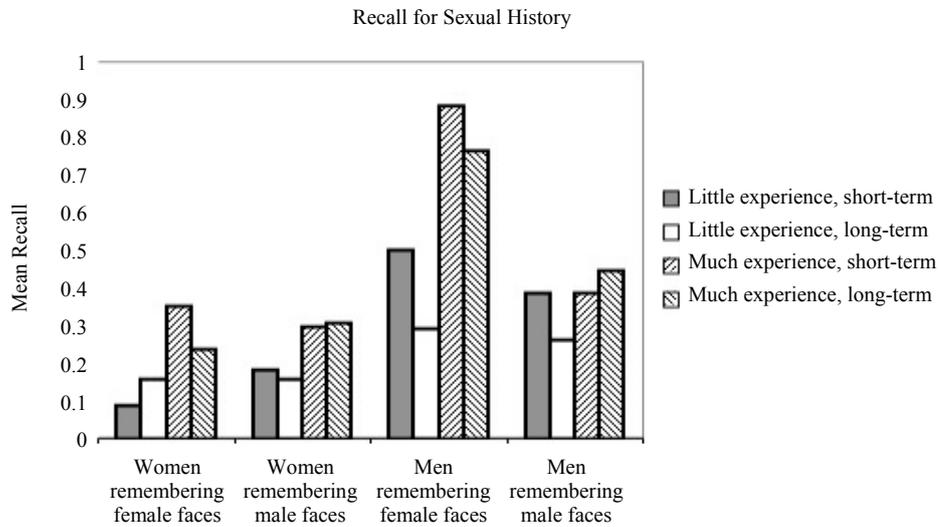


Figure 3. Mean recall of remembered information on sexual history by participants for female and male faces displaying different levels of sexual experience and desired future relationship duration

There was a significant interaction between sexual history and the sex of the face,  $F(1,49) = 6.34, p = .01$ . Paired samples  $t$ -tests revealed five significant comparisons. First, for male faces, those with much sexual experience ( $M = .27, SD = .18$ ) had their sexual history recalled more than those with little experience ( $M = .21, SD = .18$ ),  $t(50) = 2.76, p = .008$ . Second, for those with little sexual experience, participants had a higher level of recall for male faces ( $M = .21, SD = .18$ ) than for female faces ( $M = .13, SD = .15$ ),  $t(50) = 4.10, p < .000$ . Third, participants had a higher level of recall about sexual history for female faces with much ( $M = .25, SD = .15$ ) versus little ( $M = .13, SD = .15$ ) sexual experience,  $t(50) = 7.31, p < .000$ . Fourth, faces of males with much sexual experience ( $M = .27, SD = .18$ ) were recalled more than faces of females with little sexual experience ( $M = .13, SD = .15$ ),  $t(50) = 5.66, p < .000$ . Fifth, participants identified more faces of females with much sexual history ( $M = .25, SD = .15$ ) than faces of males with little sexual history ( $M = .21, SD = .18$ ),  $t(50) = 5.66, p < .000$ . No other comparison or interaction was significant.

## DISCUSSION

When shown a photograph multiple times, it is normal for an individual to change their attractiveness ratings of that photograph for a variety of reasons (e.g., the individual in the photograph becomes more familiar; PESKIN and NEWELL 2004).

Thus, we did not expect the ratings to remain constant for both phases of session one and hypothesized that it was the amount, and not the existence of change, that would differ for women and men. In this study, we expected that in the second viewing, an awareness of the dataset's range of attractiveness would cause a greater distribution of score, but for women, the distribution would be greater than for men due to the influence of the vignettes.

Mean attractiveness ratings changed as expected between the two rating phases, and the pattern of change was consistent. There is a decrease in attractiveness ratings when the photograph is associated with a person seeking a short-term relationship and this decrease is larger when associated with a person with much sexual experience. Similarly, for all combinations, there is an increase in attractiveness ratings when the photograph is associated with a person seeking a long-term relationship, and this increase is larger when associated with a person with less sexual experience. Thus, if the direction of change (i.e., increase or decrease) is considered as more important than the amount of change, the duration of a relationship that someone is seeking can be considered as a more important factor than their level of sexual experience.

Our results indicate that females' changes in attractiveness ratings are more complex than those of males' when information pertaining to one's sexual history is provided. Women's attractiveness evaluations significantly changed when they learned about someone's sexual history (i.e., there was a significant within-subjects effect) but the size of this change was not significantly different to men's (i.e., there was not a significant between-subjects effect). As seen in *Figure 2*, apart from male participants rating photographs associated with sexually experienced seekers of long-term relationships, the changes in attractiveness ratings are greater for female participants. However, the results are clearer for the impact of desired relationship duration. Although both women and men are influenced by this type of information, women's scores change significantly more than men's. Thus, we found partial support for hypothesis one and suggest that the information on the relationship being sought, and to a lesser extent the potential partner's sexual history, is more important for women than it is for men.

Furthermore, the data generally supports both components of hypothesis two. We cannot unequivocally support this prediction because there was not a significant three-way interaction between participant sex, sexual history and desired relationship duration. However, compared to their initial ratings, women's attractiveness evaluations changed more than men's when the model was said to be seeking a short-term relationship. As well, women's scores significantly changed when they learned that a model had an extensive sexual history, but the size of this change was not significantly larger than men's change in ratings.

The increase of ratings for seekers of long-term relationships can be, in part, attributed to social desirability. Those seeking long-term relationships are complying with societal normative roles to marry (BLAKEMORE, LAWTON and VARTANIAN 2005), and thus, may be viewed more favorably. Indeed, people

recognize that marrying increases one's social standing, as BLAKEMORE et al. (2005) discovered that public image underpinned both women's and men's drive to marry.

While changes in attractiveness ratings for opposite sex photographs can be explained in terms of mate preferences, this explanation does not hold for changes in ratings for same sex photographs. While it is possible that rating changes for opposite sex photographs are due to the inadvertent application of mate selection mechanisms, it is more likely that the changes are associated with intrasexual competition. That is, seekers of long-term relationships are presumably less likely to act as competitors by mate-poaching a current or future partner, and thus can be viewed more favorably compared with those who seek short-term relationships. As part of the International Sexuality Description Project, SCHMITT et al. (2004) found that, in North America, 62% of men and 40% of women self-report that they have been tempted to poach someone else's mate for a short-term sexual relationship. In contrast, approximately 20% of long-term relationships begin when one or both individuals are already involved with other people. This difference suggests that those seeking a short-term relationship are more likely to be significant threats than those seeking a long-term relationship. The latter, in an effort to secure a short-term mate, may be more likely to mate-poach a current or future partner. The same logic holds for those with much sexual experience; those who have extensive histories are presumably not overly selective about their mates and may be considered threats to one's current or future relationship.

While potentially less of a factor than their desired relationship duration, a potential partner's sexual experience does impact ratings of their attractiveness. Partners with less experience can be considered as more desirable since they are less likely to carry sexually transmitted diseases. Also, for men who engage in intercourse with women who have less sexual experience, there is a greater paternity certainty as there are fewer possible candidates to be the father of any resulting children.

As one's past behavior is the best indicator of future behavior, it was expected that sexual history would be more often, and more accurately, remembered than desired relationship duration. The finding that the overall recall (i.e., completeness) and precision (i.e., accuracy) is higher for sexual history than for relationship duration supports both components of hypothesis three.

There was no main effect for the sex of viewer on the recall of relationship duration, nor for the recall of sexual history. Thus, it is unlikely that the smaller changes we observed for men's ratings in the first session, as compared to women's ratings, are due to men not reading the vignettes or failing to encode information about the models. To be able to recall the vignettes as completely (relationship duration) or more fully (sexual history) than women, men likely paid at least equal attention to the vignettes.

What is interesting, however, is that recall rates were generally higher for male faces than for female faces. Mating is essentially composed of two elements:

intrasexual competition for mates and mate selection. Our data indicate that men may be attending to potential competitors and thus, are able to recall faces of male competitors better than faces of potential female mates. Women, in contrast, may be attending to potential mates more than potential competitors. In other words, men may not be concerned with information about a potential mate (i.e., her sexual history or desired relationship duration) as much as they are concerned about physical indicators of fertility, such as attractiveness. Hence, it may be more useful for men to focus on competition with other men for access to mates. Given that men may have low parental investment in children and mate selection is not as critical for them as it is for women (TRIVERS 1972), perhaps men attend more to issues that will better enable them to acquire a potential mate. Thus, men are better able to recall the faces and mating strategies, as evidenced by their sexual history and desired relationship duration, of potential competitors because these individuals could block access to mates. Conversely, since women have large parental investments and must be very selective about their mates, their strategy is to instead collect as much information as possible about potential mates and concern themselves less with potential competitors.

Our mean value of .64 for overall precision is quite similar to the .60 one-week test-retest correlation of BARCLAY and LALUMIERE (2006). Thus, the convergent results for similar procedures indicates that there are potential cognitive factors related to the time between the test and the retest, the “practicing” of the learned information between tests, or the method of information presentation. These factors may limit the overall accuracy of remembered information and cause a ceiling effect that limits the occurrence of significant differences in precision.

As precision is the ratio of correctly remembered information to the total amount of remembered information (both correct and incorrect), it is possible to create a numerically undefined value when no information is remembered. It is for this reason that precision is typically considered as undefined when there is no information from which to form a ratio. This limitation makes it impossible to form complex statistical models of precision and thus limits the utility of the measure. However, we believe that although limited, analysis of precision is of value in identifying the amount, and possibly the type, of erroneously remembered information.

### **Limitations**

Some limitations to this study include the participant sample, the photographs, and strategic learning. First, all participants were undergraduate students from a generally homogenous student population that is drawn from a geographically limited area. Thus, the results may not be easily generalized to other demographic and geographic samples. However, there was some socio-cultural diversity within the sample and outlier analysis did not identify any significantly unusual data

points. As well, undergraduates may lack sexual and relationship experience, and thus make different judgments to those who have more extensive experience.

Second, the photographs were of models wearing a black smock, without jewelry, and displaying a neutral expression. While providing good experimental control over attributes that could potentially influence attractiveness ratings, the uniformity of the photographs is unrealistic. Thus, there is a potential for the attractiveness ratings to be influenced by the experimental controls imposed to avoid this possibility.

A further concern is that it is possible that participants were able to guess the hypotheses of this study. Given that the participants were enrolled in psychology courses, it is possible that they were able to guess enough of the purpose of this study to allow them to respond in a manner that would reflect demand characteristics of the experiment. However, it is highly unlikely that participants would be able to systematically generate responses that are consistent with the results we have outlined in this study, particularly with regards to the recall part of the study. We should note that all participants were asked during their debriefing if they guessed the purpose of the study, and not one participant responded in an affirmative manner.

Another limitation involves strategic learning on part of the participant. When the face in the photograph displayed a sexual history similar to the participant, employed the mating strategy that the participant prefers, or sought what the participant is seeking in terms of relationship duration, the participant may be more inclined to accurately remember this face and any associated information. Future research should include a direct measure of strategic learning, whereby individuals' history and relationship status are considered in relation to the stimuli.

Finally, as all faces were predetermined to be of average attractiveness, participants were presented with photographs displaying a truncated range of attractiveness, which may have influenced attractiveness ratings and the remembered information. However, we wished to avoid any floor or ceiling effects on attractiveness ratings to allow for changes in attractiveness judgments stemming from the vignettes to be observed. We further wanted to avoid interaction effects between facial attractiveness and the contents of the vignettes; for example, we did not want all the unattractive models to seek short-term relationships and have minimal sexual experience. Furthermore, the limited number of faces (i.e., three of each sex) for each condition allowed participants to complete the sessions in a timely manner without overloading their memory, but may have further truncated the attractiveness range.

### **Future Research**

There are many avenues for future research based on the methodology employed in this study. Future research might include the impact of mate-poaching, trust-

worthiness, and career types, among other factors, on one's perception of attractiveness using the same pre-post design as used in the current study. As previously discussed, the likelihood of a person engaging in the poaching of one's current or future partner may impact ratings of same sex photographs as a result of intrasexual competition. This possibility should also be examined in future research.

The vignettes identified the sexual history and desired relationship duration for the person in each photograph, but this information may not be trusted by participants. Thus, perceptions of trustworthiness for information sources are likely to impact how we are affected by the information and the sorts of decisions we reach. For example, a participant with much sexual experience is indicating that they have a habit of engaging in short-term relationships and may not seem trustworthy when claiming to want a long-term relationship. We leave it to future research to determine the impact, on mating preferences, of trustworthiness judgments for information that is used to mediate, moderate, and form mating preferences.

Finally, future research should also address women's mate preferences and the difference between a mate who is willing to share and a mate who has resources to share, which is a distinction that has gone seemingly unnoticed in the literature. While a willingness to engage in a long-term relationship is of value to women seeking access to a partner's resources, that willingness is irrelevant if the potential partner has no resources to share. Thus, indicators of a partner's current resource level, such as their career, are likely to affect women's mate preferences. Furthermore, one could explore the effects of resource ownership on women's attractiveness judgments and memory. We predict that, given women's investment towards offspring and the need to carefully select mates, women will increase attractiveness ratings for, and have more remembrance of, men who seek a long-term relationship and express a high level of resource ownership.

## CONCLUSION

Our study finds support for all three of our hypotheses. Both men and women are impacted by the sexual history and desired relationship duration of potential partners. Women, however, are significantly more affected by knowledge of a potential mate's desired relationship duration, and to a lesser extent sexual history, than are men. All participants, regardless of their sex, are positively influenced by those who have little experience and who are seeking long-term relationships, and negatively influenced by those who have much experience and who are seeking short-term relationships. Both women and men can significantly better recall information about sexual history than desired relationship duration.

When making an attractiveness judgment, information on a person's desired relationship duration affects the direction of rating changes, with sexual history affecting the size of the change. At a later point in time (i.e., a week later), memory

of sexual history is significantly more complete and accurate than for desired relationship duration. Thus, sexual history seems to be of more value in the long, as opposed to the short, term.

Although our behavior, such as our likelihood of having a short-term relationship, can affect how others view us, this effect is more pronounced for women's evaluations of attractiveness. Our findings suggest that, whereas both women and men are generally influenced by information about one's sexual history and desired relationship duration, these effects are particularly strong for women. Men, being less influenced by this information, are likely to rely more on purely physical attributes, namely attractiveness.

## REFERENCES

- BAEZA-YATES, R. and RIBEIRO-NETO, B. (1999): *Modern Information Retrieval*. Reading, MA, US: Addison Wesley.
- BARCLAY, P. and LALUMIERE, M. (2006): Do people differentially remember cheaters? *Human Nature*, 17, 98–134.
- BERSCHIED, E. and WALSTER, E. (1974): Physical attractiveness. In: Berkowitz, L. (ed.): *Advances in Experimental Social Psychology*. New York: Academic Press, pp. 157–215.
- BERSCHIED, E., DION, K., WALSTER, E. and WALSTER, G. (1971): Physical attractiveness and dating choice: A test of the matching hypothesis. *Journal of Experimental Social Psychology*, 7, 173–189.
- BLAKEMORE, J., LAWTON, C. and VARTANIAN, L. (2005): I can't wait to get married: Gender differences in drive to marry. *Sex Roles*, 53, 327–335.
- BUSS, D. (1985): Human mate selection. *American Scientist*, 73, 47–51.
- BUSS, D. (1989): Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1–49.
- BUSS, D. (1991): Do women have evolved mate preferences for men with resources? A reply to Smuts. *Ethology and Sociobiology*, 12, 401–408.
- BUSS, D. (1998): The psychology of human mate selection: Exploring the complexity of the strategic repertoire. In: Crawford, C., Krebs, D. (eds.): *Handbook of Evolutionary Psychology: Ideas, Issues, and Applications*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, pp. 405–429.
- BUSS, D. (1992): Mate preference mechanisms: Consequences for partner choice and intrasexual competition. In: Barkow, J., Cosmides, L., Tooby, J. (eds.): *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. New York: Oxford University Press, pp. 249–266.
- BUSS, D. and SCHMITT, D. (1993): Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, 100, 204–232.
- CLARK, R. and HATFIELD, E. (1989): Gender differences in receptivity to sexual offers. *Journal of Psychology and Human Sexuality*, 2, 39–55.
- CONNER, M. and ARMITAGE, C. (1998): Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, 28, 1429–1464.
- CUNNINGHAM, M., ROBERTS, A., BARBEE, A., DRUEN, P. and WU, C.-H. (1995): 'Their ideas of beauty are, on the whole, the same as ours': Consistency and variability in the cross cultural

- perception of female physical attractiveness. *Journal of Personality and Social Psychology*, 68, 261–279.
- DERMER, M. and THIEL, D. (1975): When beauty may fail. *Journal of Personality and Social Psychology*, 31, 1168–1176.
- DION, K., BERSCHIED, E. and WALSTER, E. (1972): What is beautiful is good. *Journal of Personality and Social Psychology*, 24, 285–290.
- DIXSON, A., HALLIWELL, G., EAST, R., WIGNARAJAH, P. and ANDERSON, M. (2003): Masculine somatotype and hirsuteness as determinants of sexual attractiveness to women. *Archives of Sexual Behavior*, 32, 29–39.
- ELLIS, B. (1992): The evolution of sexual attraction: Evaluative mechanisms in women. In: Barkow, J., Cosmides, L., Tooby, J. (eds.): *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. New York: Oxford University Press, pp. 267–288.
- ELLIS, B. and SYMONS, D. (1990): Sex differences in sexual fantasy: An evolutionary psychological approach. *Journal of Sex Research*, 27, 527–555.
- GANGESTAD, S. (1993): Sexual selection and physical attractiveness: Implications for mating dynamics. *Human Nature*, 4, 205–235.
- GANGESTAD, S. and SIMPSON, J. (2000): The evolution of human mating: Trade offs and strategic pluralism. *Behavioral and Brain Sciences*, 23, 573–644.
- GEARY, D. (2005): Evolution of life history trade offs in mate attractiveness and health: Comment on Weeden and Sabini. *Psychological Bulletin*, 131, 654–657.
- GELDART, S., MAURER, D. and HENDERSON, H. (1999): Effects of the height of the internal features of faces on adults' aesthetic ratings and 5 month olds' looking times. *Perception*, 28, 839–850.
- GRAZIANO, W., JENSEN CAMPBELL, L., SHEBILSKE, L. and LUNDGREN, S. (1993): Social influence, sex differences, and judgments of beauty: Putting the interpersonal back in interpersonal attraction. *Journal of Personality and Social Psychology*, 65, 522–531.
- KENRICK, D., GROTH, G., TROST, M. and SADALLA, E. (1993): Integrating evolutionary and social exchange perspectives on relationships: Effects of gender, self appraisal, and involvement level on mate selection criteria. *Journal of Personality and Social Psychology*, 64, 951–969.
- MADEY, S., SIMO, M., DILLWORTH, D. and KEMPER, D. (1996): They do get more attractive at closing time, but only when you are not in a relationship. *Basic and Applied Social Psychology*, 18, 387–393.
- O'HAGEN, S., JOHNSON, A., LARDI, G. and KEENAN, J. (2003): The effect of relationship status on perceived attractiveness. *Social Behavior and Personality*, 31, 291–298.
- OKAMI, P. and SHACKELFORD, T. (2001): Human sex differences in sexual psychology and behavior. *Annual Review of Sex Research*, 12, 186–241.
- PESKIN, M. and NEWELL, F. (2004): Familiarity breeds attraction: Effects of exposure on the attractiveness of typical and distinctive faces. *Perception*, 33, 147–157.
- REGAN, P. and JOSHI, A. (2003): Ideal partner preferences among adolescents. *Social Behavior and Personality*, 31, 13–20.
- SCHMITT, D., SHACKELFORD, T. and BUSS, D. (2001): Are men really more 'oriented' toward short term mating than women? A critical review of theory and research. *Psychology, Evolution and Gender*, 3, 211–239.
- SCHMITT, D., and 121 MEMBERS OF THE INTERNATIONAL SEXUALITY DESCRIPTION PROJECT (2004): Patterns and universals of mate poaching across 53 nations: The effects of sex, culture, and personality on romantically attracting another person's partner. *Journal of Personality and Social Psychology*, 86, 560–584.
- SCHOLASTIC (2005): *I Spy*. U.S.A: Briarpatch, Inc.
- SHACKELFORD, T. and LARSEN, R. (1999): Facial attractiveness and physical health. *Evolution and Human Behavior*, 20, 71–76.

- SPRECHER, S., REGAN, P., MCKINNEY, K., MAXWELL, K. and WAZIENSKI, R. (1997): Preferred level of sexual experience in a date or mate: The merger of two methodologies. *Journal of Sex Research*, 34, 327–337.
- SYMONS, D. (1979): *The Evolution of Human Sexuality*. New York: Oxford University Press.
- THORNHILL, R. and GANGESTAD, S. (1993): Human facial beauty: Averageness, symmetry, and parasite resistance. *Human Nature*, 4, 237–269.
- THORNHILL, R. and GRAMMER, K. (1999): The body and face of woman: One ornament that signals quality? *Evolution and Human Behavior*, 20, 105–120.
- TRIVERS, R. (1972): Parental investment and sexual selection. In Campbell B. (ed.): *Sexual Selection and the Descent of Man*. New York: Adline de Gruyter, pp. 136–179.
- VORACEK, M., HOFHANSL, A. and FISHER, M. (2005): Clark and Hatfield's evidence of women's low receptivity to male strangers' sexual offers revisited. *Psychological Reports*, 97, 11–20.
- WAYNFORTH, D. (2001): Mate choice trade offs and women's preference for physically attractive men. *Human Nature*, 12, 207–219.
- ZEBROWITZ, L. and RHODES, G. (2004): Sensitivity to 'bad genes' and the anomalous face overgeneralization effect: Cue validity, cue utilization, and accuracy in judging intelligence and health. *Journal of Nonverbal Behavior*, 28, 167–185.