



Original Articles

Own attractiveness and perceived relationship quality shape sensitivity in women's memory for other men on the attractiveness dimension



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ABSTRACT

Although recent work suggests that opposite-sex facial attractiveness is less salient in memory when individuals are in a committed romantic relationship, romantic relationship quality can vary over time. In light of this, we tested whether activating concerns about romantic relationship quality strengthens memory for attractive faces. Partnered women were exposed briefly to faces manipulated in shape cues to attractiveness before either being asked to think about a moment of emotional closeness or distance in their current relationship. We measured sensitivity in memory for faces as the extent to which they recognized correct versions of studied faces over versions of the same person altered to look either more or less-attractive than their original (i.e., studied) version. Contrary to predictions, high relationship quality strengthened hit rate for faces regardless of the sex or attractiveness of the face. In general, women's memories were more sensitive to attractiveness in women, but were *biased* toward attractiveness in male faces, both when responding to unfamiliar faces and versions of familiar faces that were more attractive than the original male identity from the learning phase. However, findings varied according to self-rated attractiveness and a psychometric measure of the quality of their current relationship. Attractive women were more sensitive to attractiveness in men, while their less-attractive peers had a stronger *bias* to remember women as more-attractive and men as less-attractive than their original image respectively. Women in better-quality romantic relationships had stronger positive biases toward, and false memories for, attractive men. Our findings suggest a sophisticated pattern of sensitivity and bias in women's memory for facial cues to quality that varies systematically according to factors that may alter the costs of female mating competition ('market demand') and relationship maintenance.

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1. Introduction

Attractiveness is a critical dimension of face perception (see, e.g., Little, Jones, & DeBruine, 2011; Rhodes, 2006; Todorov, Olivola, Dotsch, & Mende-Siedlecki, 2015 for reviews). For example, we categorize potential social and/or romantic partners on both the attractiveness (Willis & Todorov, 2006) and valence trait-dimensions (Oosterhof & Todorov, 2008) with minimal exposure to their face and associate attractiveness with a variety of positive trait-attributions (Dion, Berscheid, & Walster, 1972; reviewed in Langlois et al., 2000). Positive evaluations of attractive individuals may have evolved to maximize reproductive fitness by associating with individuals of good physical condition who, in turn, are better-placed to confer benefits onto recipients (see, e.g.,

Gangestad & Scheyd, 2005; Krupp, DeBruine, & Jones, 2011; Sell, Tooby, & Cosmides, 2009 for discussion). Consistent with this proposal, attractive facial characteristics are positively correlated with putative measures of good underlying health (e.g., Gangestad, Merriman, & Thompson, 2010; Lie, Rhodes, & Simmons, 2008; Rantala et al., 2012) and, in men, their reproductive success (Prokop & Fedor, 2011). Physical attractiveness is also an important dimension of mating competition among women, who enhance their attractiveness and/or denigrate rivals based on their attractiveness (reviewed in Vaillancourt, 2013). Collectively, attractiveness is a salient cue in potential mates and rivals for mates.

Putative cues to quality shape learning and memory for mates across many nonhuman species (see, e.g., Bailey & Zuk, 2009; Brennan & Kendrick, 2006; Dukas, 2008 for reviews). Episodic memory and the ability to mentally simulate past and future transactions (Suddendorf, Addis, & Corballis, 2009) is thought to be functionally specialized to fulfil our current goals (Conway,

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2005), including goals that maximize reproductive fitness (see Kenrick, Neuberg, Griskevicius, Becker, & Schaller, 2010 for discussion). Accordingly, cues to quality in humans, such as facial attractiveness, shape cognitive processes such as attention and memory (see also Wiese, Altmann, & Schweinberger, 2014 for a recent discussion). For example, location memory (Becker, Kenrick, Guerin, & Maner, 2005) is enhanced when viewing physically attractive women and individuals take longer to disengage their attention from attractive women's faces toward an alternate target than they do for average-looking faces or attractive men's faces (Maner, Gailliot, & DeWall, 2007). Moreover, experimentally activating mating goals increase attentional-fixation toward attractive potential mates (Maner, Gailliot, Rouby, & Miller, 2007). Biases in memory for attractive faces are underpinned by neural mechanisms involved in the encoding and processing of reward (Tsukiura & Cabeza, 2011), complementing work that demonstrates increased effort allocated to view attractive faces in experimental paradigms (e.g., 'pay-per-view'; reviewed in Hahn & Perrett, 2014). Collectively, attractiveness modulates face-processing through various neural stages of memory, independent of cues such as facial expression (Marzi & Viggiano, 2010).

Consistent with a 'goal-driven' account of memory and cognition (Conway, 2005; Kenrick et al., 2010), the effects of facial attractiveness on person memory are also shaped by personal and contextual factors. For example, attention-to and memory-for attractive same-sex rivals is enhanced among jealous individuals (Maner, Miller, Rouby, & Gailliot, 2009; see also Maner, Gailliot, & DeWall, 2007) and attention toward attractive mates is weaker among those who have a weaker preference for short-term, uncommitted relationships (Maner, Gailliot, & DeWall, 2007). Of interest to the current study, the motive to attract a romantic partner appears to bias memory for attractive faces. For example, attentional fixation toward attractive potential mates is reduced in partnered compared to single individuals (Maner, Gailliot, & Miller, 2009). Moreover, reverse-correlation paradigms demonstrate that partnered women have a less-attractive internal representation of other men's faces than un-partnered women do (Karremans, Dotsch, & Corneille, 2011). Collectively, these findings suggest that psychological and circumstantial factors, such as one's relationship status, bias memory for facial cues to attractiveness in ways that may function to maintain long-term romantic relationships.

In the current experiment, we extend this line of reasoning (Karremans et al., 2011) to test for effects of short-term changes in the quality of women's romantic relationship and their memory for attractive faces. Romantic relationship quality varies over time (Karney & Bradbury, 2005; see also Berscheid, 2010) and, on average, declines over time (Finkel, Slotter, Luchies, Walton, & Gross, 2013). Relationship maintenance is an important functional goal (see Maner, Rouby, & Gonzaga, 2008 for discussion) and monogamy may have been critical to the long-term reproductive fitness of certain species of primate (those at risk of infanticide; Opie, Atkinson, Dunbar, & Shultz, 2013). Researchers have proposed that forms of romantic expression, such as communicating love and kissing (Włodarski & Dunbar, 2013), function, at least partly, for individuals to communicate a future commitment to their relationship (Ackerman, Griskevicius, & Li, 2011). Accordingly, studies of divorcees cite lack of closeness, attention and communication as primary reasons for relationship dissolution (De Graaf & Kalmijn, 2006). Large-scale cross-cultural data suggests, however, that extra-pair partnerships are the primary cause of relationship dissolution (Betzig, 1989). Indeed, ancestral women are also thought to have engaged in extra-pair mating to increase reproductive fitness (Shackelford & Goetz, 2007; see also Jennions & Petrie, 2000). Here, we propose two alternate, although not necessarily mutually-exclusive, predictions. If relationship maintenance is important to maximize fitness (see Maner et al., 2008) and attractive females

are effective competitors for mates (e.g., Puts, Barndt, Welling, Dawood, & Burriss, 2011; Vaillancourt, 2013), activating concerns about relationship quality via experimental priming would be predicted to increase female sensitivity in memory for attractive women. Secondly, if low relationship quality increases the salience of attractive extra-pair partners (e.g., to increase female fitness Shackelford & Goetz, 2007; see also Jennions & Petrie, 2000), activating concerns about relationship quality via experimental priming would be predicted to increase female sensitivity in memory for attractive men.

We also test for two other potentially-moderating factors in the current experiment. As mental simulation is a fundamental component of episodic memory (Suddendorf et al., 2009), it is important to control for the *typical* quality of one's romantic relationship when testing for effects of short-term/flexible changes to perceived relationship quality on women's memory for other people. Indeed, as the average decline in relationship quality over time is thought to be due, in part, to greater accessibility in memory of potential stressors and responses to disputes that accumulate in a close relationship through time (e.g., 'negative affect reciprocity'; see Finkel et al., 2013), memory for attractive faces would also be predicted to correlate negatively with relationship quality when measured psychometrically. Secondly, as extra-pair partnerships (Vaillancourt, 2013) and relationship dissolution (Perilloux & Buss, 2008) are costly acts, partnered women's memory for other men may be specialized in light of their ability to compete for alternate mates, such as factors that predict their demand on the 'mating market' (e.g., their own attractiveness). Consistent with biological markets theory, where individuals of higher 'market value' are better-placed to translate their preferences into choices (Noë & Hammerstein, 1994), recent research suggests that partnered women's own attractiveness predicts the association between their preferences and actual choices for facial cues to male quality (Wincenciak et al., 2015). This relationship would be predicted to extend to women's stored knowledge, and potential choices of extra-pair partners, since putative cues to quality in women are positively correlated with their reported number of extra-pair partners and sexual partners more generally (Hughes, Dispenza, & Gallup, 2004; Rhodes, Simmons, & Peters, 2005). Thus, we also test whether partnered women's memory for attractive men is predicted by their own attractiveness, as attractive women would be expected to incur fewer costs from extra-pair partnerships or mating competition more generally (see also Vaillancourt, 2013 for discussion).

2. Method

2.1. Participants

Seventy-four heterosexual women (Mean age = 24.94 years, SD = 6.79 years) took part in our experiment. Participants were recruited on campus and within the Tayside area and received either £5 or course credit for taking part. We specifically recruited individuals who were currently in long-term romantic relationships of at least eight months in duration, in order to maximize potential variability in positive/negative memories accessible to participants over the course of their relationship (mean relationship length = 45.49 months, SD = 46.97 months). We scheduled data collection to finish mid-November 2015. All procedures were granted full ethical approval from the School of Social and Health Sciences Ethics Committee at Abertay University.

2.2. Face stimuli

We used prototype-based image transformation to objectively and systematically manipulate attractiveness in a set of 2D

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