

Original Article

What's in a Kiss? The Effect of Romantic Kissing on Mate Desirability

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Abstract: Past research suggests that various courtship rituals, such as romantic kissing, may convey useful mate quality information. Two studies were carried out to examine how purported romantic kissing abilities, as a potential cue to some form of mate information, affect appraisals of potential mating partners. In Experiment 1, 724 participants were presented with vignette descriptions of potential mating partners and were asked to rate partner desirability for various mating-related situations. The primary result of this experiment was that purported kissing ability increased mate desirability in “casual sex” mating situations for women to a greater extent than for men. Experiment 2 repeated the same procedure with another 178 participants, this time including visual information alongside vignette descriptions containing kissing-related information to examine the relative effects of these two modalities. It was found that the presence of a picture alongside a descriptive vignette negated the effect of kissing-related information only when rating potential partners on attractiveness or desirability for further courtship, though not when evaluating partners for casual sex or long-term relationship scenarios. Visual information containing “attractive” photos of potential partners was also found to have a greater effect on men’s ratings of partner desirability than on women’s ratings of partner desirability. The results are discussed in light of romantic kissing’s potential function of conveying important mate quality and desirability information, and its relative role in the presence of additional visual mate cues.

Keywords: romantic kissing, courtship, attraction, mate choice

Introduction

Selecting an appropriate mate is arguably one of the most important decisions that any sexually reproducing animal must make in order to ensure the successful propagation of their genes. In recent years, it has been found that humans display distinct aptitudes when it comes to evaluating the suitability of potential mating partners. The construct of

“attractiveness,” many aspects of which are cultural universals (Langlois et al., 2000; Perrett, May, and Yoshikawa, 1994; Singh, 1993), seems to be utilized heuristically to assess mate desirability and is purported to act as a proxy for a mate’s underlying genetic fitness. Attractiveness (as rated subjectively by observers) has variously been found to signal genetic health by virtue of fluctuating asymmetry (Grammer and Thornhill, 1994), masculine/feminine physical dimorphism (Little, Burt, Penton-Voak, and Perrett, 2001), female waist-to-hip ratio (Pawlowski and Dunbar, 2005; Singh, 1993), voice quality (Collins and Missing, 2003), skin color (Stephen et al., 2012) and various olfactory cues (i.e., Rikowski and Grammer, 1999).

Signals of mate quality, such as attractiveness, seem to be assessed in differing ways by the two sexes due to the differing levels of minimal parental investment found among humans, with the greater reproductive burden placed squarely on the shoulders of women in the form of an extended period of gestation and lactation (Trivers, 1972). Because of this difference, it appears that each sex has evolved behavioral predispositions that place the greatest value on mate selection criteria that complement these different reproductive costs. It has been found that, compared to men, women undertake a more rigorous and discriminatory mate-selection process that places the highest value on both traits signaling high genetic quality and parental investment potential. Men, on the other hand, tend to prioritize the pursuit of short-term mating partners, focusing almost exclusively on signs of genetic quality and fecundity, and displaying a willingness to pursue a much broader spectrum of potential mates with lower levels of these traits (Buss and Schmitt, 1993; Candolin, 2003; Grammer, Kruck, Juette, and Fink, 2000; Schmitt, 2003).

Because selecting a mate is often made within the context of a wider “biological marketplace” of individuals who each compete for mating partners, it follows that each individual must also consider their own “mate value” when formulating mating aspirations (Kavanagh, Robins, and Ellis, 2010; Noe and Hammerstein, 1994). Previous research has shown that attractiveness is generally considered to be the most desirable trait among women, is of considerable importance to men, and serves as a reliable surrogate measure for an individual’s mate value. Research in this field has demonstrated that attractive women show increased preferences for male masculinity and symmetry (putative good gene indicators), while also demanding higher standards of potential mating partners than less attractive females in areas such as resource acquisition potential and good parenting indicators (Little et al., 2001; Shackelford, Schmitt, and Buss, 2005; Todd, Penke, Fasolo, and Lenton, 2007).

It has been proposed that kissing, a near-ubiquitous custom among human cultures (Eibl-Eibesfeldt, 1972; Kirshenbaum, 2011), may play a significant role in the process of human mate assessment and relationship maintenance (Hughes, Harrison, and Gallup, 2007; Walter, 2008; Wlodarski and Dunbar, 2013a). Kissing might aid mate appraisal in humans by facilitating olfactory assessment of various cues for genetic compatibility (see Wedekind, Seebeck, Bettens, and Paepke, 1995), health (Durham, Malloy, and Hodges, 1993; Nicholson, 1984), genetic fitness (Thornhill and Gangestad, 1999), or even menstrual cycle phase and fertility (Thornhill et al., 2003). Although limited kissing behaviors have occasionally been observed in our closest primate cousins, bonobos and chimpanzees (de Waal and Lanting, 1997; de Waal, 2000), these rarely occur in mate assessment situations.

Romantic kissing is also thought to play a secondary role in established relationships, helping mediate the kinds of long-term pair-bonds that aid in the process of rearing offspring to maturation (Geary, 2000; Hughes et al., 2007; Wlodarski and Dunbar, 2013a).

Although it is unclear at this point exactly which of these mate assessment and retention functions romantic kissing might serve, it is almost certain that, like our other mate assessment competencies, it works primarily at a sub-conscious level (Buss and Schmitt, 1993). Just as individuals may decide that someone is attractive without being aware that their appraisal is based on the fluctuating asymmetry that signals basal genetic fitness, it is likely that romantic partners evaluate a kissing situation, sensing that a potential partner is a “good” kisser for example, without being cognizant that this assessment may result from a sub-conscious appraisal of some variant of their genetic suitability. Indeed, research into the differences between partner preferences and real-life partner choices seems to confirm that individuals sometimes lack self-awareness when it comes to factors that influence their actual mate choice behavior (Eastwick and Finkel, 2008).

Recent research into kissing behavior among college students has found interesting differences between men and women in their perceptions of the importance of kissing during various courtship and mating situations. Using self-report measures, it was found that men generally placed less emphasis on kissing than women, and that women placed greater value on kissing during both the early stages of courtship, potentially as a mate assessment device, and in the later stages of a long-term relationship, possibly to maintain and monitor the pair-bonds that underlie such relationships (Hughes et al., 2007). More recent evidence has also found that participants who are generally more sensitive to cues signaling genetic quality, including women, high mate-value participants, and participants high in sociosexual orientation, placed greater importance on kissing in early stages of romantic relationships and were more likely to have their attraction to a potential mate influenced (either positively or negatively) by an initial kiss (Wlodarski and Dunbar, 2013a). Attitudes towards kissing in romantic interactions have also been found to vary across the menstrual cycle, with women in high conception risk cycle phases, who typically show the greatest sensitivity to cues signaling fitness (Gangestad and Thornhill, 1998; Havlicek, Roberts, and Flegr, 2005; Little, Jones, and Burriss, 2007; Penton-Voak et al., 1999), stating that kissing was more important at initial relationship stages than women at low conception risk cycle phases (Wlodarski and Dunbar, 2013b).

The aim of the present experiment was to determine whether romantic kissing-related information can affect the process of human mate assessment. It was hypothesized that participants led to believe that a potential mating partner is a “good kisser,” a manifest cue potentially signaling a mate’s underlying genetic quality/suitability, will find them more attractive, will be more willing to pursue further courtship (i.e., a date) with them, will be more interested in pursuing non-committal sex with them, and be more willing to consider pursuing a long-term relationship with them. It was further hypothesized that alleged kissing abilities will have a greater influence on female partner preferences than on male partner preferences, as they have been found to be the more selective sex when it comes to utilizing signals of mate fitness. It is believed that individuals who are higher in “mate value,” as well as female participants, will generally be more discerning in their appraisals of potential romantic partners, less likely to find potential partners desirable, and

will place a greater premium on kissing abilities.

Experiment 1

Methods

Participant recruitment

An online questionnaire was distributed to several public US- and UK-based online psychological testing repositories, as well as to colleges at the University of Oxford, to recruit a convenience sample of participants. Participants were required to be over 18 years of age to complete the survey. No identifying personal data were collected, and participants were informed that their responses were completely voluntary and anonymous. Participants provided informed consent and were offered the chance to enter a prize draw for an online shopping voucher upon completion of the questionnaire. Although these data were collected as part of a larger study on kissing, with results relating to kissing attitudes published separately in Włodarski and Dunbar (2013a), the results presented here on vignette ratings have never been published.

In total, 724 participants took the survey to completion, of whom 244 were male and 480 were female, ranging in age from 18 to 63 ($M = 24.9$, $SD = 8.1$). Of the sample, 14.8% of men and 3.5% of women stated that they were either mostly or exclusively attracted to the same sex. The majority of the participants self-identified as being ethnically Caucasian (77.5%); 4.8% were Latino and 2.8% South Asian. The sample was mostly made up of North American (39.1%), British (35.8%), and Western European (6.8%) nationals. High school education was completed by 99.3% of participants, with 47.6% having attained a diploma or some college experience. Roughly half of the participants (54.6%) stated that they were in a relationship at the time of the survey.

The study was approved by Oxford University's Research Ethics Committee.

Questionnaire design

Participants were presented with descriptive vignettes of four different target individuals of the sex they stated they were most attracted to, and were asked to answer several questions about each. The vignettes were developed to represent descriptions of various personality and relationship-history traits describing each hypothetical target individual, who was also assigned a common English first name. Aspects of target individual "personalities" were described using six to seven positive, as well as two to three negative, adjectives made up of positive or negative antonyms (e.g., trustworthy/untrustworthy, warm/cold, intelligent/unintelligent), which previous research found consistently rated as desirable or undesirable personality attributes (Anderson, 1968) and which have been used successfully in previous research to create descriptive vignettes (e.g., Fisak, Tantleff-Dunn, and Peterson, 2007). Negative descriptions were included because early pilot testing indicated that purely positive descriptions were less believable or "realistic" than mixed positive and negative descriptions. Several neutral descriptions of pastimes and casual hobbies (such as running or cooking) were also included to improve authenticity. The second half of each vignette consisted of a "third-hand" account describing the target individual's relationship and sexual competences and experience; for

example, a description of how good their previous partner thought they were in bed, or whether they “enjoyed physical intimacy.” One of the competencies described in all the vignettes was the target individual’s kissing abilities, which acted as the independent variable. The exact same four vignettes were presented to every participant, except that half of the participants were randomly assigned to see vignette 1 and 4 altered to say the target individual was a “good kisser” and vignettes 2 and 3 altered to say the individual was a “bad kisser,” whereas the other half of the participants were presented with the same vignettes stating the opposite about their kissing abilities, with vignettes 1 and 4 describing the target individual’s kissing skills negatively and vignettes 2 and 3 describing them positively. The comparison of responses between participants seeing the same vignettes describe a target individual as either a “bad” or “good” kisser formed the primary independent variable of interest (i.e., the kissing condition).

An example vignettes is included below:

Rob has been described by friends as pretty trustworthy and honest. One of his favourite pastimes is cooking and staying in at home to read a good book. Though he is not very sociable, and some people see him as downright unfriendly and rude, he is very intelligent and open to trying new experiences. When his personal relationship skills were evaluated by his previous partners, they reported that Rob could be quite romantic at times, that he was a good kisser, and can be a bit adventurous when it comes to love making. He is very respectful of others and warm once you get to know him.

Upon being presented with a vignette, each participant was asked four questions about the person described in the vignette (target individual), including “How ‘attractive’ do you find this person?” “How interested would you be in going on a date with this person?”, “How interested would you be in having a casual, one-off sexual encounter with this person?”, and “How interested would you be in pursuing a committed, long-term relationship with this person?” Responses were collected using a 5-point Likert-type scale ranging from 1 (“not at all”) to 5 (“extremely”). Participants in relationships were asked to imagine they were single for the purposes of answering these questions. Multivariate analysis confirmed that there were no significant differences in mean answers to these four questions between single participants and participants in a relationship, $F(4, 719) = 1.87, p = .114$.

Because self-ratings of attractiveness have previously been found to correlate highly with both other-rated judgments of attractiveness and with behaviors related to mating aspirations (Kavanagh et al., 2010; Roberts and Little, 2008), self-rated attractiveness was used as a proxy measure for real-world mate value. Participants were asked to answer the questions “How do you think other people would rate you on physical attractiveness?” and “How do you think other people would rate you on sexual attractiveness?” on a 7-point Likert-type scale ranging from “very low” to “very high.” Mate value was estimated by averaging participant responses to these two questions, with this mean score then further grand mean centered for inclusion in the MLM analyses as a covariate of interest. The second half of the questionnaire also asked various demographic questions about sex, age, education, ethnicity and nationality.

Statistical analyses

The experiment involved asking every participant four questions about each of the four vignettes they read, with the effects of purported kissing quality analyzed using multilevel modelling techniques. Multilevel modelling was most appropriate in this context because it allowed interpretable aggregate ratings of attractiveness/mate-desirability despite multiple measures being taken for each participant and the non-independence of these ratings within each participant. Mixed Linear Models (MLM) were created to run these analyses, with participant ratings of the different vignettes treated as random factors (with random slopes and intercepts) in each model. Each MLM model also had two predictor variables included as fixed factors: kissing condition and participant sex. The predictor variable of participants' mate value (as estimated by their self-rated attractiveness) was also included in each model as a fixed covariate. Each MLM included tests for the main fixed effects of every predictor variable, as well as two-way and three-way interactions between the main predictor variable of interest (kissing condition) and the other two factors. Answers to the rating questions for each target vignette were the level 1 units of analysis, with participants acting as the level 2 units of analysis. The independent variable of "kissing quality," that is whether each participant was rating a vignette describing someone as a "bad" or a "good" kisser, was a level 1 factor.

All analyses were carried out in SPSS (version 22.0, SPSS Inc., 2013). All significance values within each of the MLM models are automatically adjusted for multiple comparisons by SPSS, and further adjustment between models was not deemed appropriate in this context as all the main analyses carried out in this paper were planned in advance, rather than being carried out as post-hoc analyses.

Results

Effects of purported kissing quality on ratings of attractiveness

For the question "How attractive do you find this person?", significant main effects were found for kissing condition and sex, with no main effect for mate value and with no significant two-way or three-way interaction effects present (see Table 1).

Table 1. Effects of purported kissing quality on ratings of attractiveness

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	2159	69.35	.001
Sex	720	15.44	.001
Mate value	720	2.41	.001
Kissing condition x Sex	2160	1.14	.287
Kissing condition x Mate value	2160	0.56	.453
Kissing condition x Sex x Mate value	1080	1.49	.226

This analysis indicated that participants who were informed that someone was good at kissing rated that person as more attractive ($M = 2.94$, $SE = 0.03$) than someone bad at

kissing ($M = 2.64$, $SE = 0.03$) and that men generally rated all target individuals more attractive ($M = 2.88$, $SE = 0.04$) than women rated them ($M = 2.70$, $SE = 0.03$).

Effects of purported kissing quality on interest in going on a date

For the question “How interested would you be in going on a date with this person?”, significant main effects were found for kissing condition and sex, with no main effect found for mate value and with no significant two-way or three-way interaction effects present between kissing condition and the other predictors (see Table 2).

Table 2. Effects of purported kissing quality on interest in going on a date

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	2152	57.71	.001
Sex	720	5.14	.024
Mate value	719	2.23	.135
Kissing condition x Sex	2152	0.01	.953
Kissing condition x Mate value	2152	1.49	.222
Kissing condition x Sex x Mate value	1077	0.52	.596

This analysis indicated that participants who were informed that someone was good at kissing were more likely to want to go on a date with them ($M = 2.94$, $SE = 0.03$) than with someone bad at kissing ($M = 2.65$, $SE = 0.03$), and that men were generally more likely to want to go on a date with all target individuals ($M = 2.85$, $SE = 0.05$) than women ($M = 2.73$, $SE = 0.03$).

Effects of purported kissing quality on interest in engaging in casual sex

For the question “How interested would you be in having a casual, one-off sexual encounter with this person?”, main effects were found for kissing condition, sex, and mate value, with a significant interaction effect found between kissing condition and sex, and with no other interaction effects found to be significant (see Table 3).

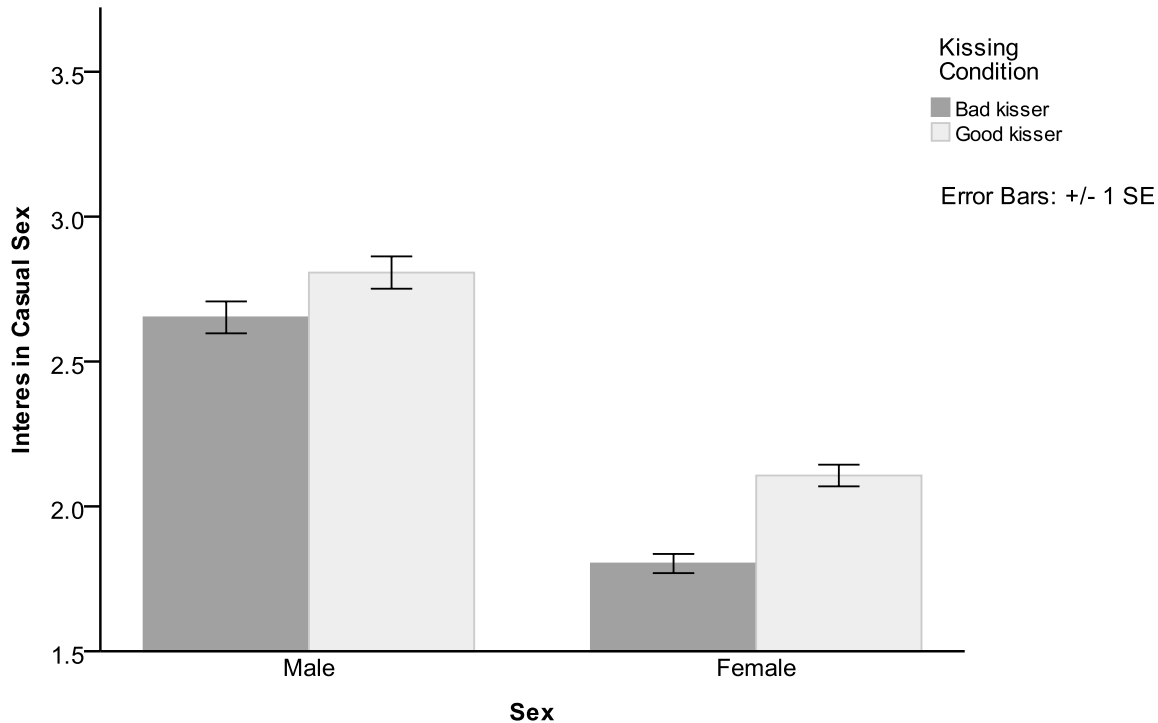
Table 3. Effects of purported kissing quality on interest in engaging in casual sex

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	2155	36.36	.001
Sex	720	152.32	.001
Mate value	719	9.60	.002
Kissing condition x Sex	2154	4.26	.039
Kissing condition x Mate value	2154	0.06	.802
Kissing condition x Sex x Mate value	1078	1.53	.216

When asked about interest in casual sex, these results indicated that participants who were told a target individual was a good kisser were more interested in having a casual

sexual encounter ($M = 2.45$, $SE = 0.04$) than when a target individual was described as a bad kisser ($M = 2.34$, $SE = 0.04$), men were more willing to have casual sex ($M = 2.75$, $SE = 0.05$) with target individuals than women ($M = 1.94$, $SE = 0.04$), and the higher the mate value of participants, the more interested they were in pursuing casual sex (slope parameter $\beta = 0.11$, $SE = 0.04$). Post-hoc MLM analyses of the interaction effect suggested that although kissing had a significant effect on interest in casual sex amongst men (bad kisser: $M = 2.65$, $SE = 0.07$; good kisser: $M = 2.81$, $SE = 0.07$; $F(1, 728) = 7.05$, $p = .008$), among women this effect was more pronounced (bad kisser: $M = 1.80$, $SE = 0.04$; good kisser: $M = 2.11$, $SE = 0.04$; $F(1, 1436) = 56.32$, $p < .001$) (see Figure 1).

Figure 1. Effect of sex and kissing condition on interest in casual sex



Effects of purported kissing quality on willingness to pursue a long-term relationship

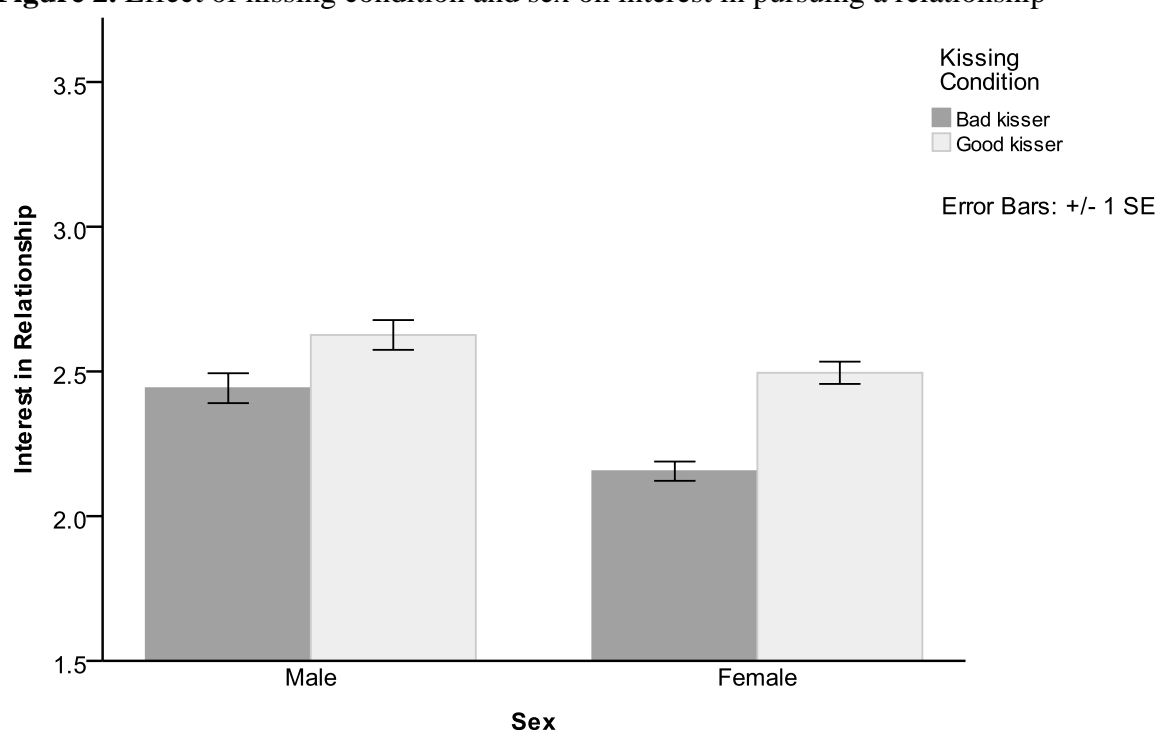
For the question “How interested would you be in pursuing a committed, long-term relationship with this person?”, main effects were found for kissing condition, sex, and mate value, with the interaction effect between sex and kissing condition approaching significance and no other interaction effects (see Table 4).

When answering questions relating to willingness to pursue a long-term relationship, it was found that participants who were told a target individual was a good kisser were more interested in having a long-term relationship with them ($M = 2.91$, $SE = 0.03$) than with target individuals described as a bad kissers ($M = 2.55$, $SE = 0.03$), men were generally more willing to pursue a relationship with target individuals ($M = 2.51$, $SE = 0.05$) than women ($M = 2.33$, $SE = 0.03$) (see Figure 2), and the higher the mate value of participants, the less likely they were to wish to pursue a relationship (slope parameter $\beta = -0.05$, $SE = 0.03$).

Table 4. Effects of purported kissing quality on willingness to pursue a long-term relationship

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	2153	41.93	.001
Sex	722	10.76	.001
Mate value	722	6.24	.013
Kissing condition x Sex	2153	3.38	.066
Kissing condition x Mate value	2153	0.41	.522
Kissing condition x Sex x Mate value	1080	0.30	.741

Figure 2. Effect of kissing condition and sex on interest in pursuing a relationship



Discussion

The results of this experiment indicate that participants led to believe that someone was a “good kisser” rated them as more attractive, and were more willing to go on a date with them, to have casual sex with them, and to pursue a committed relationship with them than if they were led to believe that the same individual was a “bad kisser.” Overall, men were more likely to rate target individuals as attractive and were more willing to pursue a date, casual sex, or a long-term relationship with them than women. The effect of kissing ability on mate desirability was significantly more pronounced among women than among men, but only when rating willingness to pursue a casual sex encounter. It was also found

that participants high in mate value were less interested in a romantic relationship, but more interested in casual sex, with a potential partner.

These findings support those of previous research that indicate kissing can play a role in mate assessment, with purported kissing abilities of a potential partner affecting their attractiveness and desirability for different mating situations, including courtship, casual sex, and long-term relationship contexts. On its own, this result may merely reflect the fact that any domain general trait rated as “good” might positively affect overall mate desirability. However, once this result is examined in light of its interaction with sex, the role of kissing becomes more obvious. It was found that the positive impact of purported “kissing quality” on a participant’s willingness to have casual sex with a potential partner was significantly greater for women than it was for men, suggesting that women may be particularly influenced by this factor. When examined in light of previous findings that women are the more selective sex during the mate assessment process, and are particularly attuned to, and discriminating about, cues signaling superior genetic fitness (Candolin, 2003; Grammer et al., 2000; Kenrick, Sadalla, Groth, and Trost, 1990), this result is highly suggestive of the conclusion that kissing may convey some mate quality information.

These findings support previous research on attitudes towards romantic kissing across different stages of mate assessment. Experiments have suggested that women generally place greater importance on romantic kissing in most romantic partner interactions and seem to do so because it serves both to convey information regarding mate quality and/or suitability, and to help in the mediation of established long-term attachment bonds (Hughes et al., 2007; Wlodarski and Dunbar, 2013a). Our data seem to confirm the use of romantic kissing as a tool for initial mate assessment, by showing that women, more than men, were significantly influenced by kissing quality in casual sex situations (where it may convey genetic quality information). A similar trend can be seen in our data when it came to assessing mates in long-term relationship contexts, with kissing quality seeming to have a greater effect on women than men, suggesting that kissing may also be useful in long-term relationship situations (where it can mediate pair-bonds). However, this trend did not reach statistical significance levels (interaction effect $p = .066$), and therefore is only suggestive at this point. These trends were not evident when merely judging general mate attractiveness or showing interest in pursuing a “date,” situations which have less immediate fitness consequences than casual sex or a long-term relationship (either in the form of pregnancy resulting from casual sex, or the significant time and effort investments of a relationship). This suggests that kissing-acquired information may be particularly pertinent for mating situations with immediate fitness outcomes, perhaps due to the fact that romantic kissing is not without its risks, such as exposing relative strangers to numerous potential infection hazards (Cowan et al., 2002; Schoch-Spana, 1992; Tully et al., 2006).

The current experiment also found that men were more likely across the board to find descriptions of potential mating partners more attractive, were more willing to date them, much more willing to have casual sex with them, and more willing to pursue a relationship with them. This result is in line with previous observations that the smaller minimal parental investment burden shouldered by men favors short-term mating strategies involving the pursuit of a much broader range of potential mating partners (Buss and Schmitt, 1993; Candolin, 2003; Grammer et al., 2000; Schmitt, 2003). That women are the

more discerning sex when it comes to partner choice was most clearly highlighted by their much lower willingness to pursue casual sexual encounters as compared to men, the one situation that carries the highest immediate risk of incurring parental burden, and one that might be considerably more onerous if choice of mating partner is poor.

Our findings also demonstrate that mate value can play a role in the evaluation of potential romantic partners. Participants of higher mate value (i.e., those who rated themselves as more attractive) were found to be less interested in pursuing a romantic relationship with a potential partner, although they were more interested in pursuing casual sex. This variation in mate desirability among participants with differing mate values is partly explained by the theory that mate choice exists in the context of a wider “biological marketplace,” where individuals who are in high demand, and are cognizant of the fact that they are in high demand, can be generally more selective when choosing potential mates (Noe and Hammerstein, 1994; Pawlowski and Dunbar, 1999). In this case, high mate value individuals were less likely to wish to pursue long-term relationships with any of the target individuals described in the vignettes, perhaps because they can afford to be selective about with whom they wish make such significant mating investments. Attractive men and women have been previously found to be more promiscuous in their mating strategies (i.e., Little et al., 2001; Perilloux, Cloud, and Buss, 2013; Rammsayer and Troche, 2013), preferring casual sexual encounters to long-term relationship situations, with these strategies potentially explaining why we found higher mate value to be associated with greater interest in pursuing casual sex.

Experiment 2

Because kissing is just one of many cues that are used when assessing the value of potential mates, it is likely that the effects of kissing might be affected by the presence of other mate cue information. Humans are a primarily visual species, and although past research suggests that there is multi-modal interplay between the senses when it comes to mate assessment, it is visual cues that are generally prioritized over our other senses (Foster, 2008; Kovacs et al., 2004; Saxton, Lyndon, Little, and Roberts, 2008). Because of this, it seems likely that in the presence of both kissing-related informational cues and traditional visual cues, visual cues may take precedence when it comes to making assessments about a potential mate. Furthermore, as research shows that men are neurologically more responsive to visual sexual stimuli than women (Hamann, Herman, Nolan, and Wallen, 2004), sex differences may exist in the relative value placed on visual cues of attractiveness as compared to other cues, such as olfactory cues as assessed by romantic kissing. This suggests that the presence of visual cues may affect the impact of any mate quality cues inherent in kissing.

To examine the role of visual cues, a smaller sample of participants were presented with the same kissing vignettes as in Experiment 1, but alongside visual mate information (i.e., a profile picture). It was predicted that kissing information would generally be less effective at influencing mate assessments when placed alongside visual mate information, which is the dominant sensory modality in humans. Furthermore, it was predicted that men would be more influenced by the presence of visual cues than women, due to their greater reliance on visual mate information.

Methods

Participant recruitment was the same as for Experiment 1. A total of 178 participants completed the survey with pictures present alongside each descriptive vignette, including 64 men and 114 women, ranging in age from 18 to 63 ($M = 23.9$, $SD = 7.4$). Of the sample, 10.9% of men and 3.5% of women stated they were either mostly or exclusively attracted to the same sex. Participants predominantly self-identified as Caucasian (80.3%), with 4.5% identifying as South Asian and 3.4% as Latino. The sample was mostly made up of British (51.7%), North American (26.4%), and Western European (5.6%) nationals. High school education was completed by 98.9% of participants, with 44.4% having attained a diploma or some college experience. Slightly more than half of the participants (57.9%) stated that they were in a relationship at the time of the survey. A multivariate test again showed that there were no significant differences between single participants and participants in a relationship on answers to questions about partner desirability, $F(4, 173) = 2.78$, $p = .063$.

Questionnaire design

The design of the questionnaire in this experiment was identical to that of Experiment 1, except that participants were also shown four different “headshot” images of hypothetical mating partners (target individuals), with one image paired with each of the four vignettes. The images consisted of life-like composite photos (corrected to be indistinguishable from real photos) of faces that had been previously rated as either highly attractive (two photos) or unattractive (two photos) (Braun, Gröndl, Marberger, and Scherber, 2001; Jones et al., 2010). The design ensured that each participant viewed two vignettes with partners described as bad kissers, one vignette partnered with an attractive photo and one with an unattractive photo, and two vignettes rating partners as good kissers, one with an attractive photo and one with an unattractive photo.

Participants were again asked four questions about the target individual based on their vignette and photo: “How ‘attractive’ do you find this person?”, “How interested would you be in going on a date with this person?”, “How interested would you be in having a casual, one-off sexual encounter with this person?”, and “How interested would you be in pursuing a committed, long-term relationship with this person?” Responses were collected using a 5-point Likert-type scale ranging from 1 (“not at all”) to 5 (“extremely”).

Statistical analyses

The same Mixed Linear Model analyses were carried out as in Experiment 1, with the addition of “partner attractiveness” as a fixed factor, both as a main effect and as an interaction effect with the other predictor variables in each model.

Results

Effects of purported kissing quality on ratings of attractiveness

For the question “How attractive do you find this person?”, significant main effects were found only for attractiveness of the picture presented, with no main effects for kissing condition, sex, or mate value. Significant two-way interactions were found between kissing

condition and mate value and between sex and picture attractiveness (see Table 5).

Table 5. Effects of purported kissing quality on ratings of attractiveness

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	523	1.35	.246
Sex	174	0.84	.360
Mate value	174	2.70	.102
Picture attractiveness	523	224.99	.001
Kissing condition x Sex	523	0.42	.520
Kissing condition x Mate value	523	6.11	.014
Kissing condition x Picture attractiveness	523	1.43	.232
Picture attractiveness x Sex	523	38.80	.001
Picture attractiveness x Mate value	523	0.38	.540
Kissing condition x Sex x Mate value	523	2.11	.147
Kissing condition x Picture attractiveness x Mate value	523	0.84	.360
Kissing condition x Sex x Picture attractiveness	523	0.05	.821
Picture attractiveness x Sex x Mate value	523	0.07	.798

This analysis indicated, not surprisingly, that potential partners with more attractive pictures were rated as generally much more attractive (attractive picture: $M = 2.89$, $SE = 0.06$; unattractive picture: $M = 1.90$, $SE = 0.06$). The first interaction suggests that for target individuals described in vignettes as bad kissers, higher mate value participants were less likely to find them attractive (slope parameter $\beta = -.13$, $SE = .04$, $t(356) = -3.01$, $p = .003$), whereas for target individuals with vignettes describing them as good kissers, mate value had no effect (slope parameter $\beta < -.01$, $SE = .05$, $t(356) = 0.06$, $p = .950$). The second interaction indicates that whereas men rated target individuals with the attractive picture as much more attractive ($M = 3.16$, $SE = 0.09$) than target individuals with the unattractive picture ($M = 1.77$, $SE = 0.09$), $F(1, 191) = 203.34$, $p < .001$, among women this difference was much smaller (attractive picture: $M = 2.64$, $SE = 0.07$; unattractive picture: $M = 2.05$, $SE = 0.07$; $F(1, 341) = 52.09$, $p < .001$) (see Figure 3a).

Effects of purported kissing quality on willingness to go on a date

For the question “How interested would you be in going on a date with this person?”, significant main effects were found only for attractiveness of the picture, with no main effects for kissing condition, sex, or mate value. Significant two-way interactions were found between sex and picture attractiveness (see Table 6).

This analysis again indicated that when presented with descriptions of potential partners that included attractive pictures, participants were generally more willing to go on a date with those partners (attractive picture: $M = 2.68$, $SE = 0.06$; unattractive picture: $M =$

2.11, $SE = 0.06$). The interaction indicates that whereas men were more willing to go on a date with potential partners represented by attractive pictures ($M = 2.93$, $SE = 0.10$) than unattractive pictures ($M = 2.01$, $SE = 0.10$), $F(1, 191) = 60.71$, $p < .001$, among women this difference was smaller (attractive picture: $M = 2.44$, $SE = 0.07$; unattractive picture: $M = 2.23$, $SE = 0.07$; $F(1, 340) = 5.68$, $p = .018$) (see Figure 3b).

Table 6. Effects of purported kissing quality on willingness to go on a date

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	522	2.70	.101
Sex	174	0.87	.352
Mate value	174	3.31	.071
Picture attractiveness	522	60.36	.001
Kissing condition x Sex	522	0.03	.871
Kissing condition x Mate value	522	3.46	.063
Kissing condition x Picture attractiveness	522	0.04	.837
Picture attractiveness x Sex	522	25.88	.001
Picture attractiveness x Mate value	522	0.91	.340
Kissing condition x Sex x Mate value	522	0.10	.747
Kissing condition x Picture attractiveness x Mate value	522	0.01	.948
Kissing condition x Sex x Picture attractiveness	522	0.05	.825
Picture attractiveness x Sex x Mate value	522	0.09	.765

Effects of purported kissing quality on willingness to engage in casual sex

For the question “How interested would you be in having a casual, one-off sexual encounter with this person?”, main effects were found for kissing condition, picture attractiveness, and sex, with no main effects for mate value. A significant interaction was found between sex and picture attractiveness, and between kissing condition, picture attractiveness, and mate value (see Table 7).

These results indicate that when asked about casual sex: participants told a target individual was a good kisser were more interested in having a casual sexual encounter with them ($M = 2.06$, $SE = 0.07$) than when a target individual was described as a bad kisser ($M = 1.92$, $SE = 0.07$); males were generally much more willing to have casual sex with target individuals ($M = 2.32$, $SE = 0.09$) than females were ($M = 1.63$, $SE = 0.07$); and all participants were more likely to wish to pursue casual sex with any target partner represented by an attractive picture than an unattractive picture (attractive picture $M = 2.36$, $SE = 0.07$, unattractive picture $M = 1.62$, $SE = 0.07$). The interaction suggests that while males were more willing to have sex with a target partner represented by an attractive picture ($M = 2.91$, $SE = 0.12$) than an unattractive picture ($M = 1.75$, $SE = 0.12$), $F(1, 191) = 107.19$, $p < .001$, among females this difference was smaller (attractive picture $M = 1.80$, $SE = 0.07$, unattractive picture $M = 1.50$, $SE = 0.07$, $F(1, 340) = 18.11$, $p = .001$) (see

Figure 3c).

Table 7. Effects of purported kissing quality on willingness to engage in casual sex

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	522	4.21	.041
Sex	174	32.15	.001
Mate value	174	1.79	.183
Picture attractiveness	522	132.58	.001
Kissing condition x Sex	522	0.26	.610
Kissing condition x Mate value	522	2.05	.153
Kissing condition x Picture attractiveness	522	0.60	.439
Picture attractiveness x Sex	522	44.15	.001
Picture attractiveness x Mate value	522	1.44	.231
Kissing condition x Sex x Mate value	522	0.31	.580
Kissing condition x Picture attractiveness x Mate value	522	7.05	.008
Kissing condition x Sex x Picture attractiveness	522	0.77	.379
Picture attractiveness x Sex x Mate value	522	0.57	.451

Post-hoc analyses of the three way interaction (adjusted for multiple comparisons) suggested that when it came to rating bad kissers, participants were more willing to pursue casual sex with targets represented by an attractive picture ($M = 2.09$, $SE = 0.08$) than an unattractive picture ($M = 1.55$, $SE = 0.08$), $F(1, 175) = 33.35$, $p < .001$. However, when it came to rating good kissers, an interaction effect suggested that when a target was represented by an unattractive picture, there was no effect of mate value (slope parameter $\beta = -0.02$, $SE = 0.07$), but when a target was represented by an attractive picture, higher mate value individuals were less willing to pursue casual sex with them than were lower mate value individuals (slope parameter $\beta = -0.27$, $SE = 0.07$), interaction $F(1, 176) = 11.28$, $p < .002$.

Effects of purported kissing quality on willingness to pursue a long-term relationship

For the question “How interested would you be in pursuing a committed, long-term relationship with this person?”, main effects were found for kissing condition, picture attractiveness, and mate value, with no main effect for sex. A significant interaction was found between sex and picture attractiveness (see Table 8).

When answering questions relating to willingness to pursue a long-term relationship, it was found that participants who were told a target individual was a good kisser were more interested in having a long-term relationship with them ($M = 2.14$, $SE = 0.06$) than with target individuals described as a bad kissers ($M = 1.96$, $SE = 0.06$), individuals were more likely to wish to pursue a relationship with a target individual described using attractive pictures ($M = 2.25$, $SE = 0.06$) than unattractive pictures ($M = 1.85$, $SE = 0.06$), and the higher the mate value of participants, the less likely they were to

desire a relationship (slope parameter $\beta = -0.10$, $SE = 0.08$). The interaction effect meant that men were more willing to pursue a relationship with target individuals with attractive pictures ($M = 2.51$, $SE = 0.10$) than with unattractive pictures ($M = 1.78$, $SE = 0.10$), $F(1, 190) = 39.31$, $p < .001$, whereas among women there was no significant difference (attractive picture: $M = 2.00$, $SE = 0.08$; unattractive picture: $M = 1.93$, $SE = 0.08$; $F(1, 340) = 0.77$, $p = .380$) (see Figure 3d).

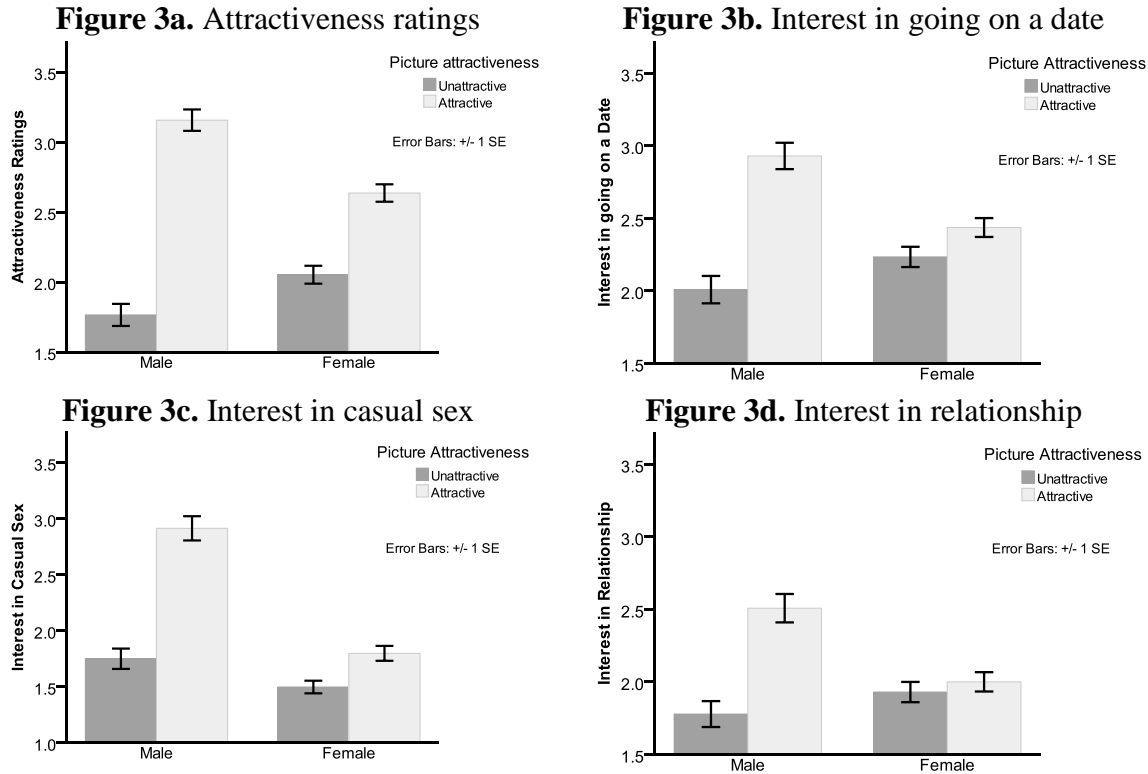
Table 8. Effects of purported kissing quality on willingness to pursue a long-term relationship

	<i>df</i>	<i>F</i>	<i>p</i>
Kissing condition	520	6.78	.009
Sex	174	1.26	.263
Mate value	174	8.93	.003
Picture attractiveness	520	29.29	.001
Kissing condition x Sex	520	0.84	.359
Kissing condition x Mate value	520	2.62	.106
Kissing condition x Picture attractiveness	520	1.60	.206
Picture attractiveness x Sex	520	19.55	.001
Picture attractiveness x Mate value	520	0.23	.636
Kissing condition x Sex x Mate value	520	0.01	.934
Kissing condition x Picture attractiveness x Mate value	520	0.04	.849
Kissing condition x Sex x Picture attractiveness	520	0.48	.488
Picture attractiveness x Sex x Mate value	520	0.60	.438

Discussion

The results from Experiment 2 show that although the presence of visual information alongside a descriptive vignette eliminated the effect of “good kissing” abilities on ratings of partner attractiveness and interest in going on a date with that partner, the presence of visual cues did not alter the positive effect of kissing quality information on partner desirability for casual sexual encounters or long-term relationships. Not surprisingly, participants presented with attractive pictures of a hypothetical target partner rated them as more attractive, and were more willing to go on a date, pursue casual sex, or a committed relationship with them. In all cases, however, this effect was moderated by sex, with attractive visual information having a much greater effect on men’s ratings of partner desirability than on women’s ratings.

Figure 3. Interaction effects of sex and picture attractiveness on ratings of partner attractiveness, willingness to go on a date, interest in casual sex, and interest in relationship



These findings highlight the conflicting roles that different mate cues might play in the process of assessing and selecting a mate. That the presence of visual information interferes with kissing-related mate information, though only in certain mate selection situations, suggests there is a more complex interplay between these two cues than initially assumed. When it came to assessing potential mates on relatively innocuous mate assessment criteria, such as rating their attractiveness or going on a “date,” participants seemed to rely exclusively on visual information. However, when partners were assessed in light of the potentially more “costly” mating situations of pursuing casual sex or a relationship, where the consequences of poor mate choice are more immediate and severe, then kissing-related information managed to significantly affect partner assessment even in the presence of visual cues. This suggests that kissing might convey salient information about a potential mate, either about their genetic fitness (compatibility) or their long-term relationship potential, which is at least as important as information that can be garnered from visual cues. This finding mirrors past research suggesting a complex multi-modal cue interplay whereby people take into account, and prioritize, certain cues depending on the mating context that they find themselves in (Foster, 2008; Kovacs et al., 2004; Saxton et al., 2008).

Results from Experiment 2 also suggest that men and women react differently to picture attractiveness, with men rating potential partners much more positively on all criteria in the presence of an attractive picture than women, suggesting that they are more

influenced by picture attractiveness than women. This finding is in line with a large body of past research that indicates men in general tend to prioritize cues of physical attractiveness and fecundity in potential partners more than women (Buss, 1989; Townsend and Wassermann, 1998; Waynforth and Dunbar, 1995). Furthermore, men also show higher physiological responses to visual sexual stimuli than women (Hamann et al., 2004), thus further explaining the greater influence of visual cues on mate decisions found in this experiment. It is interesting to note that although visual cues still had some effect on female ratings of attractiveness and willingness to pursue a date or casual sex, they did not affect female ratings of interest in pursuing a relationship. This is likely because women place greater value than men on mate cues signaling potential, long-term parental investment (Bjorklund and Shackelford, 1999; Buss, 1989; Shackelford et al., 2005), which may be more difficult to assess from basic morphological visual information alone.

Lastly, when it came to mate value this experiment replicated some of the findings of Experiment 1, showing that high mate value participants were less likely to wish to pursue a relationship with target individuals in the presence of a picture, while also being less likely to pursue casual sex with a “good kisser” target individual in the presence of an attractive picture. Furthermore, it was also found that high mate value participants rated potential partners as less attractive if they were also rated as a bad kisser. These results may again demonstrate the increased levels of selectivity displayed by high mate value participants, who can afford to be more selective and thus may discount a greater proportion of potential mates as less desirable across multiple different mating situations.

General Discussion

The primary finding of this study is that purported kissing abilities can influence a potential mate's attractiveness and general desirability, particularly for women in casual sex situations. Whereas previous research on attitudes towards romantic kissing has been conducted using self-report attitude measures (i.e., Hughes et al., 2007; Wlodarski and Dunbar, 2013a), this study is the first to use an experimental design in an attempt to measure whether romantic kissing conveys information that is actively utilized in the process of mate assessment. Although the findings presented here corroborate the notion that kissing serves a functional role in mating situations, we can still only speculate at this point as to the mechanisms by which kissing might carry out these functions. It is likely that kissing works to affect initial mate assessment by bringing two individuals into close proximity so as to facilitate some kind of olfactory/gustatory assessment, since olfaction in most mammals, as well as in humans, can play an important role in assessing potential mates (e.g., Penn and Potts, 1999; Wedekind et al., 1995). In established relationships, on the other hand, the contact and physiological arousal initiated by continued romantic kissing is likely to also affect feelings of attachment between individuals over time, influencing the release of neuropeptides (including oxytocin and vasopressin), dopamine, and opioids, which have all been variously associated with human pair-bonding (de Boer, van Buel, and Ter Horst, 2012). Future, more methodologically challenging research is needed to help clarify which of these mechanisms is the most likely pathway by which kissing can affect mating interactions.

These studies are also the first to examine the relative roles of kissing-based and

classical visual mate information. The vast majority of research into human mate selection has focused on visual mate cues, perhaps justifiably so as vision dominates human interaction with the world (Levin, 1993). However, these results suggest that other mate cues, such as the kinds of olfactory cues that might be assessed during romantic kissing, may also play an important role in this involved process. As olfaction is an important and evolutionarily-conserved mode of mate assessment across mammal taxa (Clutton-Brock and McAuliffe, 2009), the possibility exists that this sense may be a more accurate form of mate assessment than visual senses, which have only recently evolved to become the dominant sense in humans. Furthermore, these results highlight the need to take into account the type of mate assessment being made by an individual (i.e., merely rating attractiveness versus rating desirability for long-term relationships), as these differing mating interactions seem to be affected in divergent ways by different mate cue modalities.

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