

Self-Identified Heterosexual's Judgments of Same-Sex Facial Attraction and its Role in Mate

Retention Threat Identification

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It has been well supported by research that the physical features of human faces are indicators of general health, fertility, and genetic fitness (Barber, 1995; Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998; Thornhill & Gangestad, 1996; Thornhill & Gangestad, 1999; Zebrowitz et al., 2002). In fact, proponents of sexual selection theory posit that individuals who evolved to successfully identify these traits gained some aspect of quality for their offspring (i.e., increasing their odds of successful copulation and/or by obtaining good genes; Andersson, 1994). Over time, humans began to unconsciously identify which facial features indicated the healthiest and most fertile individuals—this resulted in the perception of attractive versus unattractive faces.

There are three distinct factors of human faces that contribute to its perceived attractiveness: symmetry, averageness, and hormone markers (Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998; Thornhill & Gangestad, 1999). First, it is hypothesized that bilateral symmetry indicates the ability to resist environmental stressors and maintain a stable development (Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998; Thornhill & Gangestad, 1996; Thornhill & Gangestad, 1999). Symmetrical faces may also indicate genetic heterozygosity (high genetic variability across the genome, which allows for a larger breadth of responses to environmental challenges) and reveal information on an individual's ability to defend against parasites (Fink & Penton-Voak, 2002; Grammer & Thornhill; Thornhill & Gangestad, 1999). Second, facial averageness is the extent to which an individual's face reflects the typical face for a population. It is hypothesized that averageness may also indicate genetic heterozygosity (Fink & Penton-Voak, 2002; Grammer & Thornhill,

1994; Moller & Thornhill, 1997; Perret et al., 1998). For example, in a study conducted by Langlois and Roggman (1990), it was discovered that participants preferred composite photographs (created by digitally blending 32 faces) to photographs of individuals. Finally, hormone markers are features of the human face that result from the increased presence of either testosterone or estrogen. These facial features result in masculine male faces and feminine female faces respectively (Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998; Thornhill & Gangestad, 1999). The development of secondary sexual physical features such as these are posited to reveal the quality of one's immune system—because testosterone and estrogen lower immunocompetence, only healthy individuals can afford to develop exaggeratedly feminine or masculine facial features (Grammer & Thornhill, 1994; Thornhill & Gangestad, 1999). The tendency for female faces to portray more feminine features than male faces and male faces to portray more masculine features than female faces is described as sexual dimorphism (Fink & Penton-Voak, 2002; Perret et al., 1998; Thornhill & Gangestad, 1999).

### **Sexual Dimorphism**

Previous research indicates that these secondary sex characteristics associated with males and females (sexual dimorphism) result in the perception of what is attractive in male and female faces. For females, high eyebrows, large eyes, prominent cheekbones, narrow cheeks, a small nose and chin, a big smile, and smooth, homogenous skin were reported as highly attractive by males (Cunningham, 1986; Rhodes, 2006; Valenzano et al., 2006). These traits exemplify what is perceived as “femininity” (Rhodes, 2006).

For males, the research is more convoluted, resulting in inconsistencies related to what physical features make the “ideal” masculine face. However, with puberty, the male face changes in a variety of ways (Johnston et al., 2001; Rhodes, 2006; Thornhill & Gangestad, 1999).

According to Thornhill & Gangestad (1999), “the cheekbones, mandibles and chin grow laterally, the bones of the eyebrow ridges and central face grow forward, and the lower facial bones lengthen”--these traits signal masculinity (pg. 456). However, research on male facial attractiveness is not as simple as changes in facial bone structure. Early research found that, among males, masculine faces were preferred to feminine faces, but more recent studies have found evidence suggesting that feminized male faces are preferable (Rhodes, 2006; Thornhill & Gangestad, 1999). According to Rhodes (2006), this may be due to the increased use of photographic sex continua in modern research on facial attractiveness. Because creating composite male faces averages out many stereotypically masculine features (e.g., coarse skin textures and square jaws), studies using male composite faces may be missing several potentially attractive traits (Rhodes, 2006). Rhodes (2006) points out that studies using unaltered faces generally find that ratings of masculinity correlate positively with attractiveness.

Despite the plethora of research investigating human facial attractiveness, only one study has attempted to examine whether same-sex judgments of attractiveness differ from opposite-sex judgments (Zebrowitz & Rhodes, 2002). In this study, Zebrowitz and Rhodes (2002) found evidence that judgments of other-sex faces often reflect sexual/romantic attractiveness, whereas judgments of same-sex faces often reflect imagined desirability to other-sex individuals or non-sexual/non-romantic attractiveness (i.e., likeability). However, what this study failed to investigate was whether same-sex judgments of facial attractiveness serve as a tactic to identify potential threats to one’s relationship. Therefore, the current study has been designed to examine the role of perceptions of same-sex facial attractiveness in the identification of threats to one’s mate.

### **Mate Retention Theory**

Historically, one of the most important factors of successful long term mating and reproduction is successful mate retention (Buss, 1993; Buss, 1998; Buss & Schmitt, 1993). Reproduction is a very energy-consuming task—for our early ancestors, a task so energy-demanding it was incredibly difficult to successfully complete alone. The dedication of time, energy, and/or resources to aid in successful reproduction is defined as parental investment (Trivers, 1972). Biologically, males and females have discrepant amounts of minimum obligatory parental investment. For males, a single act of sexual intercourse resulting in a pregnancy is the minimum. On the other hand, females must commit at least the nine months of gestation, which by itself is very energy consuming. A male could have a child every night of the year, while a female is only biologically capable of a single full-term pregnancy a year. (Buss, 1998; Eagly & Wood, 1999; Trivers, 1972). Based on this fact alone, one may assume that males and females would differ in preferred mating strategy. Thus, it would be advantageous for females to pursue partners who are willing to contribute more parental investment in their offspring in a long-term relationship, and for males to pursue a multitude of sexual partners (in an attempt to have as many offspring as possible to carry his genes). However, the adoption of either a short or long-term mating strategy for both males and females is situationally dependent (Buss, 1993; Buss, 1998; Buss & Schmitt, 1993). Females engaging in short-term strategies must be able to identify a mate willing bestow immediate (but short-term) resources, as well as possessing genes high enough in quality to make up for his lack of commitment. For males to take full advantage of the benefits of short term-mating, they must be able to determine who is sexually available to them, obtain many fertile partners, and minimize any investment in any one particular mate. In practice, this is no easy feat (Buss, 1993; Buss, 1998; Buss & Schmitt, 1993).

Therefore, pursuing a single, long-term relationship with one sexual partner is a highly viable strategy (Buss, 1993; Buss, 1998; Buss & Schmitt, 1993). However, there are still many challenges to overcome in the process of identifying a partner with high reproductive value to mate long-term with. Males must be able to identify females who are fertile, possess quality genes, are unlikely to engage in infidelity, and have good parenting skills. On the other hand, females must be able to identify males who are willing to invest resources into the relationship and offspring, commit to a long-term relationship, protect their female mate, possess (and can acquire further) resources, and possess good parenting skills. The tasks associated with long-term mate selection are difficult to accomplish; however, unlike with short-term strategies, they need only to be overcome once (Buss, 1993; Buss, 1998; Buss & Schmitt, 1993).

Unfortunately, by committing to a singular mate, both males and females risk losing their long-term partner for a variety of reasons, ranging from: the death of their partner, their partner's infidelity, and/or subsequent parental investment in another person's children. Therefore, it is highly beneficial for individuals employing long-term mating strategies to also employ techniques to retain their mate.

For males, there is an additional concern motivating mate retention tactics: paternal uncertainty (Buss, 1995; Buss & Schmitt, 1993; Trivers, 1972). Females are always certain that they are genetically related to all of their children—because the pregnancy is hosted in the female's body, she is guaranteed her maternal certainty. However, males can not be certain that a child belongs to him. His partner could have become pregnant by another male, and early humans would have had no method of determining the paternity of a child (Buss, 1995; Buss & Schmitt, 1993; Trivers, 1972). Thus, if a male is indeed cuckolded (meaning his mate engaged in intercourse with another male) and duped into raising and committing resources toward another

man's child, fewer of his resources are available to any offspring actually related to him—effectively reducing the odds of his genes being successfully passed on to subsequent generations. Therefore, it is vital that a male defends his mate from other suitors to increase the odds that any children produced by his mate are genetically his (Buss, 1995; Buss & Schmitt, 1993; Trivers, 1972).

### **Mate Retention Tactics**

Although males may benefit more from being able to prevent their mate from being poached by other prospective mates, both sexes deploy a variety of mate retention tactics. In fact, studies have shown that some of these tactics correspond with the expressed desires of the opposite sex. When defending their mate, females have been shown to increase efforts to enhance their physical appearance, which is in line with the male tendency to value physical attractiveness (Buss, 2006; Buss & Shackelford, 1997; de Miguel & Buss, 2011). Females have also been found to use verbal signals of possession (Buss & Shackelford, 1997) as well as punish their mate's threats of infidelity (Buss & Shackelford, 1997; de Miguel & Buss, 2011). Verbal signals of possession include discussing her relationship status with others (particularly females) and assuring others of the high quality of her relationship. Females punish threats of infidelity by threatening to end the relationship or chastising her mate's apparent interest in another female (Buss & Shackelford, 1997).

Alternatively, male mate retention tactics involve granting their mate more resources, which reflects females' desire for high parental investment from their mates (Buss, 2006; de Miguel & Buss, 2011). Other studies have identified additional tactics as well. In addition to allocating more resources, males have also been found to employ submission and debasement. Submission and debasement are defined as behaviors that intentionally under-emphasize a male's control to

give the female more influence in a relationship. These behaviors include giving in to their female mate's wishes and making extra efforts to please her, as well as understating his control in the relationship (Buss & Shackelford, 1997; de Miguel & Buss, 2011). Males have also been found to employ intrasexual threats. These are threats designed to increase the perception of mate retention threat in their female partners (Buss & Shackelford, 1997). Intrasexual threats include acts like making comments about the attractiveness of another male's mate to induce jealousy in his own mate (Buss & Shackelford, 1997).

### **Same-Sex Attraction as a Mate Retention Threat Identification Technique**

However, the question remains as to how one identifies when to apply mate retention tactics and to whom. Surely it would be disadvantageous to employ these tactics against all same-sex individuals who only *might* attempt to encroach on one's mate—the resources required to do so would be immense. Consequently, people must have methods for determining which same-sex individuals pose a higher chance of successfully stealing their mate. As previously discussed, facial features reveal much about the mate quality of an individual (Barber, 1995; Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998; Thornhill & Gangestad, 1996; Thornhill & Gangestad, 1999; Zebrowitz et al., 2002). Therefore, it is possible that humans are able to accurately detect potential threats to one's relationship by recognizing attractive facial features in the faces of those belonging to the same sex and associating those with attractive facial features with high mate quality, and therefore threat as well. If so, then same-sex judgments of same-sex facial attractiveness likely serve as a mate retention detection strategy in which potential threats to one's relationship are identified. Additionally, because of the role of paternity uncertainty in male mate retention, males (in comparison to females) may identify faces as more threatening in order to cope with this threat. Consequently, if people are able to



accurately identify these attractive facial features, it would allow them to selectively employ other mate retention strategies with more success and without wasting resources on those posing less threat.

### **The Current Study**

Thus, the current study is designed to examine heterosexual adult's same-sex judgments of facial attractiveness and whether these judgments correlate with those of perceived mate quality and threat. To date, only one study has examined same-sex perceptions of facial attractiveness (Zebrowitz & Rhodes, 2002). However, what this study failed to investigate was whether same-sex judgments of facial attractiveness serve as a tactic to identify potential threats to one's relationship. Based on previous research, sexual selection theory, and mate retention theories, it is expected that: (H1) attractive faces from the Chicago face database will be perceived by same-sex participants as better quality partners and as more threatening than unattractive faces from the Chicago face database, and (H2) the extent to which attractive same-sex faces were perceived as threatening was expected to be moderated by the participant's sex, with attractive faces being more threatening to males than females.

## **Method**

### **Participants**

A total of 300 adults (143 males, 157 females) residing in the United States were recruited via Amazon's® online crowdsourcing website, Mechanical Turk® (MTurk®). In this study, we were interested in heterosexual, cisgendered individuals, therefore the study required that all participants be over the age of 18 and both heterosexual and cisgender. However, 7 participants failed to complete the survey and 55 participants responded incorrectly to one of two attention check items. Thus, the final sample size for the current study was 238 adults (117 men, 121

women). Participants had a mean age of 36.64 years ( $SD = 10.87$ ) and the majority identified as either married (47.4%) or single (24.7%). Participants on average reported being in 4.92 relationships in the past ( $SD = 6.07$ ), and on average participants' longest relationship lasted 9.80 years ( $SD = 2.65$ ).

### **Measures and Materials**

**Facial stimuli.** A total of 40 facial images (20 male, 20 female) were used from the Chicago Face Database (CFD) for the purposes of the current study (Appendix A). These faces were all pictured in a neutral expression and varied across ethnicity, sex, and attractiveness (as rated and normed by the CFD). As part of the selection process, the 10 most attractive male, 10 most attractive female, 10 least attractive male, and 10 least attractive female faces were chosen. This was done to examine the differences in perceptions of attractive and non-attractive faces. All participants viewed all faces of the same sex as the participant. Please see Appendix B for examples of these images and Table 1 for the results of comparative preliminary analyses.

**Partner quality scale (PQS).** The PQS was comprised of five items and was completed after viewing each facial stimulus (see Appendix C). Participants rated each face using a seven-point scale, ranging from 1 (completely disagree) to 7 (completely agree), and were asked about their perceptions of the target's mate quality. For example, one item asked to what extent the participant felt that this person (the target) would make "a good parent." The PQS score was calculated by obtaining the mean for the scale, with a higher score indicating a perception of higher mate quality. The PQS appeared to have excellent internal consistency,  $\alpha = .91$ .

**Threat scale (TS).** The TS measured the perceived likelihood of threatening behavior of each face and included 6 items (see Appendix D). Participants rated each face using a seven-point scale, ranging from 1 (extremely unlikely) to 7 (extremely likely) and were asked about

their perceptions of the target's likelihood of engaging in behavior that could threaten a relationship. For example, one item asked how likely the participant felt that the target would "have a one-night stand behind their partner's back" (assuming the target was in a relationship). The TS score was calculated by obtaining the mean for the scale, with a higher score indicating a perception of higher likelihood of threatening behavior. The TS appeared to have excellent internal consistency,  $\alpha = .94$ .

**Demographics questionnaire.** The participants also completed a demographics questionnaire including items assessing age, gender, sexuality, and relationship status. Additional questions included how satisfied participants in relationships were with their relationship, information about their partner, their relationship history, as well as perceptions of their own physical attractiveness. Please see Appendix E for items from the Demographics Questionnaire.

### **Procedure**

Participants were recruited via Amazon's Mechanical Turk (MTurk®). All participants were informed that they were participating in a 20-minute anonymous online study on the perceptions of same-sex faces. Interested participants were automatically directed to an informed consent form (see Appendix F) which provided more information about the study. Participants providing consent were then sent to the online surveys and facial images hosted via Qualtrics® (an online survey tool). Each participant viewed all 20 faces (in randomized order) and provided ratings on the PQS and the TS for each face. These scales were developed for the purposes of this study but were adapted from existing scales. Additionally, each participant completed the demographics questionnaire. Upon completion of the measures, participants were debriefed by reviewing the debriefing statement (see Appendix G). Participants were then compensated for their time by receiving a \$0.50 deposit into their MTurk® account.

## Results

To examine H1, two *t*-tests were completed to assess perceptions of partner quality and threat between attractive and unattractive faces. The results revealed that attractive faces were perceived as higher quality mates ( $M = 4.57$   $SD = 0.92$ ) as compared to unattractive faces ( $M = 3.72$   $SD = 1.09$ ),  $t(236) = 13.46$ ,  $p < .001$ ,  $d = 0.84$ . Attractive faces were also perceived as more threatening ( $M = 3.61$   $SD = 1.23$ ) as compared to unattractive faces ( $M = 3.00$   $SD = 1.22$ ),  $t(236) = 9.76$ ,  $p < .001$ ,  $d = 0.50$ .

Next, a 2 (attractiveness) x 2 (sex) mixed-design ANOVA was completed to examine the effects of the attractiveness of the facial images and the sex of the participant on perceptions of threat. Consistent with the *t*-test, the results indicate that attractive faces were perceived as more threatening than unattractive faces  $F(1, 235) = 96.25$ ,  $p < .001$ ,  $\eta p^2 = .29$ . A main effect of sex also emerged, in which males rated the facial stimuli as more attractive ( $M = 3.47$ ,  $SD = 1.08$ ) than did females ( $M = 3.15$ ,  $SD = 1.16$ ),  $F(1, 235) = 4.73$ ,  $p = .03$ ,  $\eta p^2 = .02$ . Finally, the results of the ANOVA also provided support for H2, in which the interaction between attractiveness and sex was significant,  $F(1, 235) = 10.30$ ,  $p = .002$ ,  $\eta p^2 = .04$ . A simple effects analysis indicated that the effect of attractiveness on threat was significant for males ( $F[1, 235] = 22.19$ ,  $p < .001$ ,  $\eta p^2 = .09$ ) but not females ( $F[1, 235] = 0.97$ ,  $p = .33$ ,  $\eta p^2 = .00$ ). In particular, males were on average more threatened by attractive faces ( $M = 3.81$   $SD = 1.11$ ) than were females ( $M = 3.41$   $SD = 1.31$ ).

## Discussion

To review, the current study examined how perceptions of attractiveness in same-sex individuals influence perceptions of partner quality and threat. Because facial features are indicators of an individual's mate value, these features are referenced when selecting a mate and

evolved to be perceived as attractiveness over time (Barber, 1995; Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998; Thornhill & Gangestad, 1996; Thornhill & Gangestad, 1999; Zebrowitz et al., 2002). However, for those engaging in long-term mating strategies, simply finding an individual with high mate quality is not enough to obtain a high likelihood for successful mating—the mate must be retained as well (Buss, 1993; Buss, 1998; Buss & Schmitt, 1993). As a result, there are multiple mate retention tactics employed by males and females to defend their mate from other suitors and to prevent their mate from engaging in mating behaviors with other individuals (Buss & Shackelford, 1997). However, the literature does not address how people determine when to employ a mate retention tactic, and the current study sought to explain one method by which individuals make this determination: the ability for heterosexual individuals to detect relative mate value and threat in the faces of same-sex individuals via their attractiveness.

### **Heterosexual Perceptions of Same-Sex Partner Quality and Threat**

As was indicated by the results, participants rated attractive faces as higher in both partner quality and threat than were unattractive faces. The participant's tendency to do so suggests that individuals of the same sex are able to detect the same facial cues that opposite-sex individuals pick up on when selecting a mate (Andersson, 1994). Essentially, based only on the attractiveness of each face, participants were able to make judgements on the mate value and threat associated with each face. However, because heterosexual people have no desire to enter into a relationship with members of the same sex as them (American Psychological Association, 2008), the ability to detect attractiveness in same-sex faces must serve a different purpose. As was hypothesized in this study, the ability to detect these cues in human faces may serve as a mate retention threat identification technique in heterosexual individuals. In other words, being

able to decide which same-sex individuals pose a substantial potential threat to one's relationship by detecting their attractiveness may inform people as to when they should apply a mate retention tactic. Those individuals who evolved to be able to detect attractiveness in the faces of same-sex individuals would have been more equipped to successfully employ mate retention tactics and would, as a result, had more success in maintaining their mate and raising their children to maturity.

Because facial features cue the health and fertility of a person to potential mates, these facial features are referenced when selecting a mate. This is ultimately why these facial features became associated with attractiveness (Barber, 1995; Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998; Thornhill & Gangestad, 1996; Thornhill & Gangestad, 1999; Zebrowitz et al., 2002). Therefore, it was beneficial for heterosexual individuals to be able to also associate attractiveness with these indications of partner quality in same-sex faces. However, when viewing same sex faces an individual must feel motivated to defend their mate from attractive same-sex individuals. This is why attractive faces are viewed as both high quality mates *and* as threatening by same-sex individuals. Without also associating threat with attractiveness, being able to determine partner quality in same-sex faces would not nearly be as useful for heterosexual individuals examining same-sex faces.

### **Paternity Uncertainty and Perceptions of Threat**

The results also indicated that males were significantly more threatened by attractive faces than were females. The existing literature supports this finding. As discussed earlier, an additional concern for males in mate retention is the issue of paternity uncertainty. Unlike females, who are always definitively certain that her children are genetically related to her, males cannot be certain that any child born to his mate is genetically his (Buss, 1995; Buss & Schmitt,

1993; Trivers, 1972). Modern technology not considered, males never truly know if a pregnancy is a result of himself, or some other male. Because of this fact, it would be highly beneficial for males to be more sensitive to competitors as they must defend against their female mates having a child with another male (Buss, 1995; Buss & Schmitt, 1993; Trivers, 1972).

Females also benefit from preventing their mates from impregnating other females—however, unless her mate decides to abandon their long-term relationship and delegate resources to someone else, a female has very little to lose from her mate engaging in short-term mating strategies in addition to their long-term strategy (Buss, 1995; Buss & Schmitt, 1993; Trivers, 1972). As long as resources are not diverted away from her, she in fact may stand to lose nothing at all. Alternatively, males stand to lose much more if their mates engage in infidelity. At the minimum, if a male's mate becomes pregnant by another male, he cannot reproduce with her himself for almost an entire year. In the worst case scenario, if a male is unaware that his mate has become pregnant by another male, he will unwittingly commit his time and resources to raising a child which is not genetically related to him (Buss, 1995; Buss & Schmitt, 1993; Trivers, 1972). When the name of the game is successfully passing down one's genes to future generations, dedicating resources to a genetic stranger is losing. Because of this fact, males benefit more from the successful retention of his mate. Therefore, it would also be beneficial for males to be more sensitive to threatening same-sex individuals than females are.

### **Limitations and Future Directions**

There are several limitations associated with this study. First, the literature indicates that attractiveness and mate value in humans is signaled by more than just facial features (Barber, 1995; Buss & Schmitt, 1993; Gangestad & Scheyd, 2005; Thornhill & Gangestad 1996).

However, this study only examined facial attractiveness. As a result, this study does not capture a

comprehensive examination of perceptions of same-sex attractiveness. Another limitation is that both scales used in this study measure their respective constructs by means of proxies.

Perceptions of mate value and threat associated with each face were not directly measured, and instead used questions intended to reflect these perceptions. Therefore, the validity of these scales for their respective constructs cannot be guaranteed. Finally, this study did not determine the relationship between perceptions of threat and the actual implementation of mate retention theories. As a result, the results of this study cannot conclusively determine whether same-sex perceptions of threat based on attractiveness truly serve as a cue for mate retention tactics.

### **Conclusions and Implications**

There are a handful of implications associated with this study. First, it is vital to understand the evolutionary roots of human mating behavior to understand human mating behavior today. Adaptations that were beneficial to our ancestors often persist in humans today. When behaviors resulting from long-gone environments are removed from those original environments, their purpose and functions can become unclear or misunderstood. Attempting to examine our behavior through an evolutionary lens can help clarify these misunderstandings.

In particular, the results of this study may have implications for therapists and practitioners working with couples struggling with jealousy or behaviors associated with mate retention tactics. If the evolutionary function of these behaviors and feelings is understood, couples may be able to more successfully navigate the existence of these behaviors in their relationship. Additionally, better understanding these behaviors may assist couples in developing methods or tactics to reduce their presence in the relationship.

This study also sets the groundwork for multiple potential studies. First, additional research is required to determine whether increased perceptions of threat based on attractiveness result in



the increased application of mate retention tactics. If this is the case, the hypothesis that attractiveness serves as cue for the need for other mate retention tactics would be even better supported. Future research may also look to determine if and how mate retention tactics manifest in online environments. With the rapidly increasing presence of the internet in today's society, how might these behaviors exist in the context of the internet? This is especially pertinent when one considers the fact that humans are able to keep tabs on more of their significant other's behavior today than ever before through the internet and social media.

Future research may also look to examine and measure the extent to which these results are replicable with ethnically diverse populations. Analyses on perceptions of partner quality and threat were not examined through the lens of ethnicity, so the potential effects of this variable are unknown. Finally, future research may also look to examine the impact of the menstrual cycle on female perceptions of other female faces. It is currently unclear whether or not the menstrual cycle has an impact on perceptions of threat in same-sex faces for heterosexual females, but the impact it has for females on perceptions of male attractiveness may suggest it may in fact effect same-sex perceptions.

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**Appendix A**

Facial Images from the Chicago Face Database

Male:



Attractive



Unattractive

Female:



Attractive



Unattractive

**Appendix B**

**Gender x Attractiveness**

There was a significant difference in mean attractiveness rating between males ( $M = 4.57, SD = 0.27$ ) and females ( $M = 5.09, SD = 0.20$ ),  $t(18) = -4.96, p < .001$ .

Variable	Attractiveness Result	Sex Result
Age	A < U	-
Afraid	A < U	-
Angry	A < U	M < F
Disgust	A < U	M < F
Feminine	A > U	M < F
Happy	A > U	-
Masculine	A < U	M > F
Sad	A < U	-
Threatening	A < U	-
Trustworthy	A > U	-
Unusual	A < U	-

**General Face Comparisons**

**Race Comparisons: Attractiveness**

	White	Latino	Black	Asian	Total
Attractive	5	5	9	1	20
Unattractive	9	2	5	4	20

\* No significant differences

**Race Comparisons: Sex**

	White	Latino	Black	Asian	Total
Males	6	6	4	4	20
Females	8	1	10	1	20

- Significant difference:  $\chi^2(3) = 8.23, p = .04$ .

### Appendix C

#### Partner Quality Scale (Thompson & O'Sullivan, 2013)

1. On a scale from 1 to 7, 1 being completely disagree and 7 completely agree, do you think this person would make a good parent.
2. On a scale from 1 to 7, 1 being completely disagree and 7 completely agree, do you think this person is "spouse material."
3. On a scale from 1 to 7, 1 being completely disagree and 7 completely agree, do you think this person would make a good romantic partner.
4. On a scale from 1 to 7, 1 being completely disagree and 7 completely agree, do you think this person would treat their romantic partner well.
5. On a scale from 1 to 7, 1 being completely disagree and 7 completely agree, do you think this person is a "good catch."



## Appendix D

### Threat Scale (Buss & Shackelford, 1997)

1. On a scale from 1-7, 1 being extremely unlikely and 7 being extremely likely, how likely do you think it is that this person would engage in the following behaviors, assuming this individual is in a relationship? - Flirt with a member of the opposite sex behind their partner's back
2. On a scale from 1-7, 1 being extremely unlikely and 7 being extremely likely, how likely do you think it is that this person would engage in the following behaviors, assuming this individual is in a relationship? - Passionately kiss a member of the opposite sex behind their partner's back
3. On a scale from 1-7, 1 being extremely unlikely and 7 being extremely likely, how likely do you think it is that this person would engage in the following behaviors, assuming this individual is in a relationship? - Go on a romantic date behind their partner's back
4. On a scale from 1-7, 1 being extremely unlikely and 7 being extremely likely, how likely do you think it is that this person would engage in the following behaviors, assuming this individual is in a relationship? - Have a one-night stand behind their partner's back.
5. On a scale from 1-7, 1 being extremely unlikely and 7 being extremely likely, how likely do you think it is that this person would engage in the following behaviors, assuming this individual is in a relationship? - Have a brief affair behind their partner's back
6. On a scale from 1-7, 1 being extremely unlikely and 7 being extremely likely, how likely do you think it is that this person would engage in the following behaviors, assuming this individual is in a relationship? - Have a serious affair behind their partner's back

**Appendix E****Demographics Questionnaire**

Please provide a response for the following questions. All information provided will be kept confidential and will be used only for the purposes of this study.

1. Age: \_\_\_\_\_ (in years)
  
2. What gender do you identify with?
  - a. Man
  - b. Woman
  - c. Transgender man
  - d. Transgender woman
  - e. Gender queer/gender nonconforming
  - f. I would prefer not to disclose
  - g. Other (please specify): \_\_\_\_\_
  
3. What is the highest level of education you have completed?
  - a. \_\_\_ Some high school
  - b. \_\_\_ High school or equivalent
  - c. \_\_\_ Some college/university
  - d. \_\_\_ Completed college/university
  - e. \_\_\_ Post graduate training/degree
  - f. \_\_\_ Other: please specify: \_\_\_\_\_
  
4. What is your family or household's income level?
  - a. \_\_\_ Less than \$10,000
  - b. \_\_\_ \$10,000-\$20,000
  - c. \_\_\_ \$20,000-\$55,000
  - d. \_\_\_ \$55,000-\$75,000
  - e. \_\_\_ \$75,000-\$100,000
  - f. \_\_\_ \$100,000+
  - g. \_\_\_ Don't know or prefer not to answer
  
5. Which of the following best describes your sexual orientation?
  - a. \_\_\_\_\_ Heterosexual (Straight)
  - b. \_\_\_\_\_ Gay
  - c. \_\_\_\_\_ Lesbian
  - d. \_\_\_\_\_ Bisexual
  - e. \_\_\_\_\_ Queer
  - f. \_\_\_\_\_ Unlabeled
  - g. \_\_\_\_\_ Don't know
  - h. \_\_\_\_\_ Other, please specify: \_\_\_\_\_

6. Circle the number that best describes your sexual experience:

Entirely with the same sex    1    2    3    4    5    6    7    Entirely with the opposite sex

7. Circle the number that best describes your current feelings of sexual attraction:

Entirely to the same sex    1    2    3    4    5    6    7    Entirely to the opposite sex

8. Current relationship status

- a. Single
- b. Dating
- c. In a monogamous relationship
- d. In a polyamorous relationship
- e. In an open relationship
- f. Cohabiting
- g. Married
- h. Divorced
- i. Other (please specify): \_\_\_\_\_

9. If you are currently in a relationship, what gender does your partner identify with?

- a. I am not in a relationship
- b. Man
- c. Woman
- d. Transgendered man
- e. Transgendered woman
- f. Gender queer/ gender nonconforming
- g. I would prefer not to disclose
- h. Other (please specify): \_\_\_\_\_

10. If you are currently in a relationship, which of the following best describes your *partner's* sexual orientation?

- a. I am not in a relationship
- b. Heterosexual (straight)
- c. Gay
- d. Lesbian
- e. Queer
- f. Unlabeled
- g. Don't know
- h. Other (please specify) \_\_\_\_\_

11. How many relationships have you been in in the past? \_\_\_\_\_

12. How long did your longest relationship last (in either years or months; please specify)

\_\_\_\_\_

13. For those currently in a romantic relationship, how satisfied are you with your current partner?

Unsatisfied 1 2 3 4 5 6 7 Satisfied

14. For those currently in a romantic relationship, how satisfied do you think your current partner is with you?

Unsatisfied 1 2 3 4 5 6 7 Satisfied

15. How physically attractive do you think you are?

Unattractive 1 2 3 4 5 6 7 Very Attractive

16. How physically attractive do you think other people think you are?

Unattractive 1 2 3 4 5 6 7 Very Attractive

17. How physically attractive do you think your current or most recent partner is?

Unattractive 1 2 3 4 5 6 7 Very Attractive

18. How physically attractive do you think other people think your current or most recent partner is?

Unattractive 1 2 3 4 5 6 7 Very Attractive

19. In total (across all current and past relationships), with how many people have you been romantically or sexually involved with outside of your primary relationship?

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20. In total (across all current and past relationships), how many times has a partner been romantically or sexually involved with someone other than you during the course of your relationship?

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## Appendix F

### Consent Form

You are invited to participate in a survey conducted by Dr. Ashley Thompson in the Department of Psychology at the University of Minnesota Duluth. This study is designed to assess people's perceptions of faces of the same sex. Please read the consent form information carefully so that you can decide whether you wish to participate in the research study. In addition, be sure to email the researchers (information provided below) with any questions you might have so that you can make an informed decision.

**What do you want me to do?** If you decide to participate in this study, you will complete several surveys assessing your background, relationship history, and your perceptions of 20 faces of the same sex. Completion of all study components will take about 20 minutes. You will receive \$0.50 via your Mechanical Turk account for completing this survey.

**Are there any risks?** It is not expected that you will experience any discomfort during the study. If you do feel uncomfortable, you can stop the study or skip any questions that make you uncomfortable. Participation in the study is completely voluntary and you may stop answering questions without the loss of compensation.

**Are my answers confidential?** Yes. Although the researchers will be asking for your worker ID, it will not be connected to your survey responses in any way. Please be aware that any work performed on Amazon MTurk™ can potentially be linked to information about you on your Amazon® public profile page, depending on the settings that you have for your Amazon® profile. We will not be accessing any personally identifying information about you that you may have put on your Amazon® public profile page. We will store your MTurk™ worker ID separately from the other information you provide to us to ensure confidentiality. If you do choose to provide your e-mail address for a summary of the results, it will not be connected with your survey responses in any way.

**Who will have access to my data?** Only the primary investigator (Ashley Thompson, Ph.D.) will have access to your information and answers (but not your identities). Your worker IDs will be stored in a separate survey data file than your survey responses, thus any identifying information will not be connected with your survey responses in any way. The website that hosts the survey is on a secure server and all data will be password-protected and locked in a secure research office for five years as per ethical process. Amazon® and Mechanical Turk® will not have access to your answers.

**How can I get more information about this research project?** If you have any questions before, during, or after the study, or if you would like to learn more about our research, please feel free to contact the primary investigator:

Dr. Ashley Thompson  
Department of Psychology  
1049 University Drive

thompsoa@d.umn.edu

To share feedback privately about your research experience, including any concerns about the study, call the Research Participants Advocate Line: 612-625-1650 or give feedback online at [www.irb.umn.edu/report.html](http://www.irb.umn.edu/report.html).

You may also contact the Human Research Protection Program in writing at D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455.

All feedback, comments, and concerns are kept in confidence.

Consent statement: By clicking the “Submit” button at the bottom of this page I am agreeing to the following statement: I have read the above description and volunteer to participate in this study. I understand that I can decide to discontinue my participation or not to provide any personal information at any time without question and without penalty. I agree that I identify as heterosexual, that I am at least 18 years of age, and that I currently reside in the United States. If you do not wish to participate, please click “no, I do not agree to participate”

- Yes, I agree to participate
- No, I do not agree to participate

## Appendix G

### Debriefing Statement

Thank you for participating in our study. Your responses on the survey and the experiences you have provided us will greatly improve our research and understanding of the psychology of masturbation. We would now like to give you some additional information about the study.

You **MUST** enter this code on the Mechanical Turk HIT in order to complete the work and receive compensation. Once your survey completion has been confirmed you will receive compensation. We try to approve work as quickly as possible, although sometimes this can take up to 24 hours.

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It has been well supported by research that the physical features of human faces are indicators of general health, fertility, and genetic fitness (Fink & Penton-Voak, 2002; Grammer & Thornhill, 1994; Perret et al., 1998). Those individuals who evolved to successfully identify these traits were able to have healthier offspring as a result (i.e., increasing their odds of successful copulation and/or by obtaining good genes; Andersson, 1994). However, raising offspring is a very resource demanding task, and it was advantageous for individuals to keep their mate to increase the likelihood of their offspring surviving. Therefore, techniques for keeping a mate and preventing them from having offspring with others have evolved in both males and females Eagly & Wood, 1999; Goetz et al, 2005). This study sought to examine one potential mate retention tactic involving our perceptions of the faces belonging to those of the same sex. Despite much research investigating facial attractiveness, only one study has attempted to examine whether the way we perceive same-sex faces differs from how we perceive opposite-sex faces (Zebrowitz & Rhodes, 2002). In this study, Zebrowitz and Rhodes (2002) found evidence that judgments of other-sex faces often reflect sexual/romantic attractiveness, whereas judgments of same-sex faces often reflect imagined desirability to other-sex individuals or non-sexual/non-romantic attractiveness (i.e., likeability). However, what this study failed to investigate was whether same-sex judgments of facial attractiveness serve as a tactic to identify potential threats to one's relationship.

We want you to know that we appreciate your time in helping us with this research. We think that one way to understand sexual behavior is to learn more about the ancestral roots of our behavior today. We hope that your responses provided in today's study will help us answer these questions.

If you have any additional questions about the study, you may reach the Primary Investigator, Dr. Ashley Thompson, by mail or email:

Dr. Ashley Thompson  
Department of Psychology  
1049 University Drive

thompsoa@d.umn.edu

To share feedback privately about your research experience, including any concerns about the study, call the Research Participants Advocate Line: 612-625-1650 or give feedback online at [www.irb.umn.edu/report.html](http://www.irb.umn.edu/report.html).

You may also contact the Human Research Protection Program in writing at D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455.

All feedback, comments, and concerns are kept in confidence.

**To be compensated for taking part in the study, please provide your Mechanical Turk® worker ID in the space provided.**