THE ATTRACTIVENESS OF EMOTION EXPRESSIONS

by

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B.A., The University of British Columbia, 2010

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

MASTER OF ARTS

in

The Faculty of Graduate Studies

(Psychology)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

August 2012

Abstract

This research included two sets of studies examining the relative sexual attractiveness of individuals showing several distinct emotion expressions. In the first set of studies, we examined the extent to which men and women find members of the opposite sex displaying expressions of happiness, pride, and shame, compared with a neutral control, sexually attractive. In the second set of studies, we probed into the mechanisms underlying a somewhat surprising finding from the first set of studies, that male displays of shame are particularly attractive to North American women. Finally, we tested whether women's attraction to high-status men-- a possible factor underlying the attractiveness of pride and shame—varies across cultures.

Across all five studies, using different images and samples ranging broadly in age and ethnicity (total N =1273), several findings emerged. First, there was a large gender difference in the sexual attractiveness of happy displays: happiness was the most attractive female emotion expression, and one of the least attractive in males. In contrast, pride showed the reverse pattern. Second, shame displays were relatively attractive in both genders, and, among some women judges, male shame was more attractive than male happiness, and not substantially less than male pride. Third, American women at high-conception risk were less attracted to men showing shame than low-conception risk women, suggesting that male shame displays may be indicative of poorer genetic fitness. Fourth, Indian women were found to be less attracted to men showing shame than American women, further suggesting that American women's attraction to shame-displaying men is due to socio-cultural factors. Fifth, status was found to be more relevant to male attractiveness among Indian than American women, suggesting that shame's low-status message is less problematic for its attractiveness among American women.

Overall, this research provides the first evidence that distinct emotion expressions have divergent effects on sexual attractiveness, which vary by gender but largely hold across age. These findings also provide an explanatory account of the attractiveness of male shame found among several North American samples; this pattern is best explained by cultural factors and cannot be accounted for by biological factors.

Preface

A version of chapter 2 was previously published as Tracy, J. L., & Beall, A. T. (2011). Happy guys finish last: The impact of emotion expressions on sexual attraction. *Emotion, 11*, 1379-1387. I oversaw all data collection and co-authored the manuscript.

Chapter 3 is based on work conducted in the Emotion and Self Laboratory by myself and Dr. J. L. Tracy. I designed methodology, oversaw data collection, performed statistical analyses, and lead-authored the writing of the manuscript.

The research in chapters 2 and 3 was approved by the UBC Behavioural Research Ethics Board. UBC BREB Certificate Number: H07-02274.

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Acknowledgements

Thanks so much to all of my wonderful, lifelong friends. It means the world to know that you'll always be there to pick me up when I'm down. Also, I'm eternally grateful to my two academic supervisors Mark Schaller and Jessica Tracy. You are the two best mentors I could have ever hoped for… I've sat here for about 40 minutes trying to find the appropriate words to express my gratitude for all the two of you have done for me and now I'm convinced there are none sufficiently strong enough to do so. I settled on these 4 (8 if you count the ones in parentheses):

I'll (try my best to) make you proud.

Dedication

To my mom. I love you. You're the best person in the world, I mean that with all of my heart. PS. Thanks for still doing my laundry, sorry about the state of my towels.

Chapter 1 Introduction

With over 7 million active users, OKCupid is the largest free online matchmaking site in the United States. Its research blog OKTrends is viewed by over 12 million new readers a year. A few months prior to January 10th, 2010, the research team at OKTrends embarked on an ambitious project devoted to uncovering some of the biggest myths in online dating. After cataloguing and analyzing the profile pictures and dating success of a random sample of over 7,000 OKCupid members, the researchers found that one major misconception topped their list of myths about dating success for men: "It's better to smile."

Showing a happy face is considered essential to any friendly social interaction, including those involving sexual attraction. Yet few empirical studies have examined whether a happy expression is in fact, attractive. Are women interested in men who smile, or do they prefer men who appear confident? Do men seek happy women, or are they more drawn to those who are demure, averting their gaze and showing shame? Given that most social interactions entail the spontaneous display of emotion expressions (Ekman, 2003), and are, to some extent, guided by judgments of attractiveness (Reis et al., 1982), it is likely that emotion expressions have some impact on attractiveness. The aim of the present research was to compare the relative attractiveness of several different emotion expressions, and explore the underlying cultural and biological mechanisms that contribute to these effects.

1.1 The Evolutionary Account of Emotion Expressions

If emotion expressions are an evolved part of human nature, they should be displayed and recognized reliably across cultures. Indeed, past research has shown that a small set of so-called "basic" emotion expressions, including anger, disgust, fear, happiness, sadness and

surprise, are reliably recognized by individuals across cultures, including those from highly isolated, traditional small-scale societies who are unlikely to have learned these expressions through cross-cultural contact (Ekman, Sorenson, & Friesen, 1969; Ekman & Friesen, 1971). More recently, evidence has accumulated to suggest that the self-conscious emotions of pride and shame are also cross-culturally recognized, and are spontaneously displayed universally in response to success and failure, including by congenitally blind individuals who could not have learned to display these expressions through processes of visual imitation (Haidt & Keltner, 1999; Izard, 1971; Tracy & Robins, 2008; Tracy & Matsumoto 2008).

Given this evidence for the universality of distinct emotion expressions, many researchers have adopted the perspective that these expressions are part of human nature, having evolved as automatic, adaptive responses to specific fitness-relevant circumstances faced in our evolutionary past (Darwin, 1872). For example, the facial movements involved in the disgust emotion expression have been found to effectively reduce the threat of noxious environmental stimuli by constricting the mouth and nasal passages and reducing intake of potentially hazardous air (Chapman, Kim, Susskind, & Anderson, 2009). Thus, displaying this expression in response to disgust-eliciting events may have provided physiological benefits in our evolutionary history, leading to the reliable display of disgust expressions in these situations. The fear expression, characterized by a widening of the eyes, is another example of an expression that provides physiological benefits to the expresser by increasing his or her visual field, thereby enhancing the detection of potential threats in a fear-eliciting situation (Susskind et al., 2008).

According to the Two-Stage account of the evolution of emotion expressions, in human evolutionary history emotion expressions eventually became transformed from serving purely

physiological functions to also serving more communicative functions (Shariff & Tracy, 2011). Essentially, by being regularly and repeatedly shown in the context of a particular emotional event, expressions came to be associated with these events, and eventually to communicate important information to observers about the displayer's mental state and/or current disposition (Darwin, 1872/1962; Knutson, 1996). As a result, it likely became adaptive for observers to recognize distinct emotion expressions in others, and infer information about these others' mental states on this basis. For example, past work suggests that babies as young as 12 months of age can interpret their parents' fear expressions, and use that information to guide their own behavior in ambiguous situations (Sorce, Emde, Campos, & Klinnert, 1985). Recognizing and deciphering emotion expressions is thus likely to be of critical importance to everyday social functioning.

1.2 Emotions Communicating Social Information

In addition to communicating *current* mental states of the actor, emotion expressions may also communicate his or her dispositional qualities. For example, studies suggest that those who show anger are perceived as more dominant, whereas those who express fear or surprise are perceived as less dominant (Knutson, 1996; Marsh, Adams, & Kleck, 2005; Montepare & Dobish, 2003). Signaling one's dominance or submission through these expressions would have been adaptive in humans' status-driven ancestral societies, as communicating status information is essential to establishing and solidifying one's position within the social hierarchy (Martens, Tracy, & Shariff, 2012). Thus, by conveying certain trait information, the pride expression, for example, may benefit displayers by informing others that the displayer merits high status and should be deferred to. Likewise, observers may benefit by acquiring information about which

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group members are likely to make good leaders, and also which are highly knowledgeable or skilled and thus should be copied or followed (Martens & Tracy, under review). According to this account, then, emotion expressions are essential to well-functioning social interactions and relationships, as they provide essential information about other group members.

One domain in which it is particularly important for individuals to acquire as much information as possible about others is that of mate choice. When choosing a mate, humans prioritize certain dispositional traits, and tend to seek potential mates who exhibit these desired qualities, even when they report an explicit interest in short-term romantic encounters only (Li & Kenrick, 2006). Given that certain emotion expressions communicate dispositional information that is relevant to mate value (e.g., dominance; Knutson, 1996), emotion expressions are likely to influence expressers' perceived sexual attractiveness.

Further, simply because emotion expressions may have evolved to convey dispositional qualities relevant to mate value does not mean that these displays will be equally attractive across cultures. Indeed, the functioning of evolved psychological mechanisms is sensitive to variations in local ecologies (Tooby & Cosmides, 1992) and mate preferences based on dispositional qualities may be subject to a sensitivity to differences in cultural norms and practices as well (Li, Valentine, & Patel, 2010). Yet, previous research has not systematically addressed the question of how distinct emotion expressions influence attractiveness, nor how emotion expressions may vary in attractiveness between cultures.

1.3 The Present Research

The present research examined whether three emotion expressions known to be cross-culturally recognized and to communicate information relevant to an individual's mate value (i.e., information that should influence attractiveness; Buss & Schmitt, 1993; Gangestad & Simpson, 2000) have reliable effects on the perceived sexual attractiveness of targets showing them. Specifically, we compared attractiveness judgments made for individuals displaying expressions of happiness, pride, and shame, as well as a neutral control. All three of these expressions show evidence of cross-cultural universality, suggesting evolutionary origins (Ekman, 2003; Izard, 1971; Keltner, 1995; Tracy & Matsumoto, 2008; Tracy & Robins, 2008), and convey important social information relevant to mating and romantic relationships. Pride signals the expresser's high status; studies have shown that individuals displaying pride are automatically perceived as higher status than individuals showing a range of other emotions (including shame, happiness, and neutral), and this signaling function generalizes across cultures (Shariff & Tracy, 2009; Tracy, Shariff, Zhao, & Henrich, in press). Shame, an appeasement display, signals both the expresser's low status and his/her awareness that he/she has violated a social norm; the adaptive benefit of this message may lie in its communication of the expresser's regret and implied submission to social norms (Gilbert, 2007; Keltner, 1995; Keltner, Young, & Buswell, 1997). Happiness communicates the expresser's friendliness and approachability; happy displays tend to elicit trust and approach-oriented behaviors in onlookers (Becker, Kenrick, Neuberg, Blackwell, & Smith, 2007; Brown, Palameta, & Moore, 2003). All of these messages may influence attractiveness, but, given evidence for gender-specific mating strategies (Buss, 2008), they may do so in different ways for male and female expressers.

Previous research suggests that women tend to seek partners who are reliable providers, whereas men place higher value on a potential mate's youth, health, and apparent receptivity to sexual relationships (e.g., Buss, 2008). Thus, women may find male pride displays more attractive than male happiness, given that a high-status man is likely to be a better provider than a friendly and approachable man. In contrast, men may show the reverse preferences in female expressers, given that a friendly and approachable woman may seem more sexually interested or receptive than a high-status woman. This prediction is also consistent with socio-cultural gender norms which, in many cultures, require that women appear submissive and vulnerable, and men dominant and confident (Cicone & Ruble, 1978; Rainville & Gallagher, 1990). Individuals whose behavior and appearance is consistent with these gender norms tend to be considered most attractive (Brown, Cash, & Noles, 1986; O'Doherty et al., 2003), so a proud man and happy woman may be valued for reasons of gender-norm consistency, as well as for their potentially high mate value. Indeed, perhaps because women are known to smile (the key behavioral component of the happy display) more frequently than men (LaFrance, Hecht, & Paluck, 2003), happy displays tend to be associated with femininity (Becker et al., 2007).

In contrast to these generally positive emotions, shame's low-status message may reduce attractiveness, at least in male expressers. Women who display shame might benefit from the gender-norm consistent message of low status or submissiveness, but, when sent by men, this message would be both gender-norm-inconsistent and indicative of low mate value. On the other hand, given that the shame display functions as both a low-status message and an appeasement mechanism generating forgiveness for one's transgressions, the expression's impact on male attractiveness may not be entirely negative. The shame expression is thought to

be recognized and displayed, despite its potentially harmful (to the expresser) message of low-status, because it protects a transgressing expresser from overly negative social appraisals via its appeasement effect (Keltner, Young, & Buswell, 1997). Indeed, several researchers have argued that the shame expression has been co-opted from its ancient role as a submission display, in non-human animals across species, to function in humans as a signal of trustworthiness and willingness to cooperate (Gilbert, 2007; Fessler, 2007). These messages might serve to increase a man or woman's attractiveness, given that both would indicate that the displayer is committed to the social group and its norms and beliefs, and is thus likely to be valuable group member. Although, on the one hand, it may seem odd that both pride and shame could increase attractiveness, on the other hand, if shame displays functioned only to signal failure, they would be maladaptive for the sender and thus unlikely to have evolved. Furthermore, if shame communicates high group-commitment while also informing of a social trespass, it could elicit sympathy or nurturance—traits previously found to increase attractiveness (Cunningham, Barbee, & Pike, 1990). Overall, it is somewhat unclear precisely how shame would affect attractiveness, and whether its effect would vary by gender. Competing hypotheses exist and no previous studies have examined this issue. Thus, in addition to examining the attractiveness of these displays in our first set of studies, we conducted a second set of studies to specifically probe the underlying mechanisms behind the attractiveness of male shame.

In contrast to shame, there is more prior research relevant to our predictions regarding the impact of happy and proud displays on attractiveness. The appearance of dominance, which is communicated by pride, has been shown to increase male attractiveness in several American samples (e.g., Cunningham, et al., 1990; Sadalla, Kenrick, & Vershure, 1987; Reis et al., 1982), and in non-human primates (e.g., Struhsaker, 1967). In one of the only studies to directly

examine the attractiveness of several distinct female expressions, happiness was found to increase women's attractiveness (Mueser, Grau, Sussman, & Rosen, 1984). In several other studies examining the social impact of smiling, happy expressions increased the attractiveness of female targets but had no effect on males (Penton-Voak & Chang, 2008; Schulman & Hoskins, 1986); another study found that the presence versus absence of a smile had no effect on male attractiveness, but the broadness of a man's smile was a positive predictor (Cunningham et al., 1990).[1] Finally, in a study that examined the attractiveness of male and female happy faces combined, no overall cross-gender effect emerged (O'Doherty et al, 2003).

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[1] Although smiling (i.e., raised lip corners, or, activation of the *zygomaticus major*) is only one component of the prototypical, cross-culturally recognized happy display, it is the most essential component. The only other component, raised cheeks (activation of the *orbicularis oculi*), is present only sometimes; smiles not accompanied by raised cheeks are still reliably identified as happiness, despite being less reliably associated with the experience of happiness (Ekman, 1992).

Chapter 2. Studies 1 and 2: The Impact of Emotion Expressions on Sexual Attraction

Given limited previous research on pride and shame, and somewhat equivocal prior findings on happy displays, we examined the relative attractiveness of happy, pride, and shame expressions, as well as neutral, in several large samples of younger and older North American adults. In Study 1, we compared attractiveness judgments made for one male and one female target individual, each showing all 4 expressions. In Study 2, three samples of participants, varying in age, viewed 240 different male and female targets, with different targets showing each expression.

2.1 Study 1

2.1.1 Participants and Procedure

184 Canadian undergraduates (50% female; age = 17-49 years, *median* = 21; 52% Asian, 48% Caucasian)[2] were approached by an experimenter of the same gender and asked to view one 8"x10" laminated photo of an opposite-sex target posing an expression of happiness, pride, shame, or neutral. By asking participants to view and judge only one image, we ensured that effects would not be influenced by any tendency to make comparisons among different expressers or emotions. Given our interest in studying the effects of emotion expressions on *sexual* attraction, all participants viewed and provided judgments for an opposite-sex target only, and non-heterosexual participants (i.e., those who rated themselves 3 or above a 1-7 scale where 1 = "exclusively heterosexual", 4 = "bisexual", and 7 = "exclusively homosexual") were removed from analyses. While viewing the image, participants responded to the question:

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[2] Ethnicity did not moderate any results in Study 1.

"How sexually attractive do you find this person?" using a 9-point scale ranging from 1 ("not very") to 9 ("extremely").

2.1.2 Materials

Photos were taken from the UC Davis Set of Emotion Expressions (Tracy, Robins, & Schriber, 2009), a Facial Action Coding Scheme (FACS; Ekman & Friesen, 1978)-verified set of expressions. The photos featured one Caucasian male and one Caucasian female target from the waist up (see Figure 1). All expressions featured in these photos have been shown to be reliably recognized significantly better than chance (Tracy et al., 2009), and to convey the behaviors found to be associated with each of these expressions, and no other behaviors. More specifically, the pride photos portrayed individuals displaying a small smile, head tilted slightly up, expanded chest, and arms raised above the head with hands in fists. The shame photos portrayed individuals tilting their heads down, directing eye gaze down, and slightly narrowing their chest and posture. The happy photos portrayed individuals smiling broadly with open mouth, and raising their cheeks (i.e., the Duchenne smile; Ekman, 2003).

2.1.3 Results and Discussion

To test our prediction that the effect of emotion expression on attractiveness would vary by gender, we conducted a 4 (emotion condition) x 2 (gender) between-subjects analysis of variance (ANOVA) on attractiveness ratings, and found the predicted interaction, $F_{(3,175)} =$ 9.44, $p < .01$ (see Figure 1).[3]

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[3] Because all participants viewed opposite-sex photos, "gender" refers both to targets and participants.
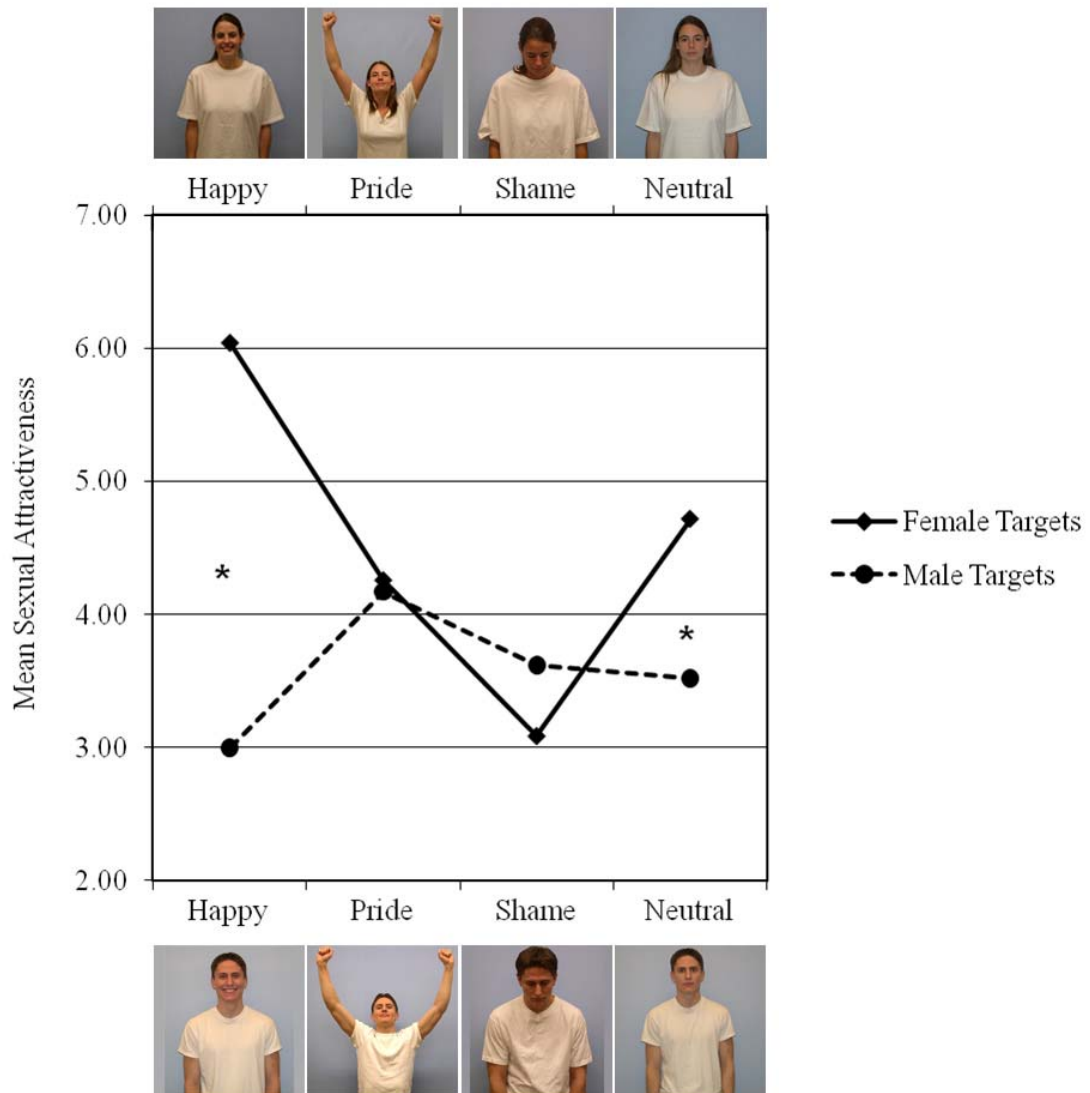
Figure 1. Mean sexual attractiveness ratings of male and female displays of emotion expressions posed by a single male and female target, Study 1. For the female target, significant differences emerged between shame and all other expressions, and between happiness and all other expressions, all $ps < .01$, except for the difference between shame and pride which was significant at the $p < .05$ level. For the male target, a significant difference emerged between pride and happy expressions, $p < .05$. Images (which were used as stimuli in Study 1) were taken from the UC Davis Set of Emotion Expressions (Tracy, et al., 2009). $N = 184$. *$p < .05$.

We next examined differences between displays within each gender, to determine how the pattern of attractiveness by emotion varied between men and women. As predicted, female happy displays were judged more attractive than female pride displays, $t(45) = 3.44$, $d = 1.02$, $p < .01$, whereas the reverse pattern emerged for the male target, $t(45) = 2.37$, $d = 0.70$, $p < .05$. Indeed, happiness was the most attractive female expression [compared to shame, $t(44) = 5.51$, $d = 1.63$, $p < .01$, and neutral, $t(44) = 2.56$, $d = 0.66$, $p < .05$]. Shame was the least attractive female expression, compared to pride, $t(43) = 2.35$, $d = 0.70$, $p < .05$, and neutral, $t(42) = 2.87$, $d = 0.87$, $p < .01$. Other than the difference between the male pride and happy displays, none of the male expressions differed significantly from each other. Directly comparing the attractiveness of each expression by gender, happy, $t(46) = 6.39$, $d = 1.88$, $p < .01$, and neutral expressions, $t(41) = 2.22$, $d = 0.69$, $p < .05$, were more attractive in women than men.

Indeed, collapsing across expression, an overall gender effect emerged on attractiveness, $t(181) = 3.49$, $d = 0.52$, $p < .01$. This difference, likely associated with the broader tendency for women to be judged more positively than men, has been previously documented (Eagly, Mladinic, & Otto, 1991; Jones, Jones, Thomas, & Piper, 2003; Raines, Hechtman, & Rosenthal, 1990). Here, this difference may also represent a response bias driven by the cultural "double standard," wherein it is considered more acceptable for men to openly express their sexual interests than it is for women to do so (D'Emilio & Freedman, 1997; Li & Kenrick, 2006). As a way of controlling for this overall gender difference in attractiveness ratings, we next standardized ratings within each gender, to equate male and female attractiveness means. We then re-analyzed results using these standard scores. The 2 (gender) x 4 (emotion expression) interaction held, $F(3, 175) = 8.54$, $p < .01$, as did the between-gender difference in ratings of

happy displays, $t(46) = 4.25$, $Ms = 0.71$ vs. -0.34, $p < .01$. The absolute gender difference in ratings of neutral displays was reduced to non-significance, $t(41) = 0.40$, $Ms = 0.08$ (female displays) vs. –0.03 (male), ns, as would be expected if these ratings are largely driven by the overall gender difference in attractiveness judgments. Interestingly, a significant difference in judgments of shame displays emerged, with male shame rated more attractive than female shame, $t(44) = 2.59$, $Ms = 0.03$ vs. -0.70, $p < .05$. For pride, the between-gender difference became marginally significant, $t(44) = 1.69$, $Ms = 0.35$ (male displays) vs. -0.14 (female), $p = .10$. Thus, it seems that the absolute gender difference in happy displays was not due to the broader gender difference in attractiveness judgments, and that shame displays may actually be *more* attractive in men than women when this broader difference is taken into account.

Overall, these findings are largely consistent with our expectations; happiness was more attractive in women than men, both relative to the other expressions and in terms of an absolute gender difference, and even when controlling for the overall gender difference in attractiveness ratings. In addition, pride was more attractive in men than women, but only relative to the other expressions—though the lack of an absolute gender difference here may partly be due to the broader tendency of men to rate women more attractive than women rate men. The specific nature of this pattern was somewhat unexpected; although we predicted a gender difference for happy and pride expressions, we had expected a larger absolute gender difference for pride displays than happy; the very low ratings of male happiness were somewhat unexpected, as was the absence of a difference between male shame and pride, and the finding that male shame was more attractive than female shame when standard scores were used.

However, given that only two targets were included in this study, these results could be due to unique physiognomic features of these individuals. To address this concern, Study 2

included multiple targets portraying each expression. Study 2 also included several different samples of viewers, one of which was drawn from a population of older adults, allowing us to test whether results vary by viewer age.

2.2 Study 2

2.2.1 Participants and Procedure

Three samples of participants (total N = 857; see below for details on each sample) viewed photos, online, of different opposite-sex targets displaying each of the four expressions, in a randomized order. For each photo, participants responded to the question, "How sexually attractive do you find this person?" using a 9-point scale ranging from 1 ("not very") to 9 ("extremely"). Non-heterosexual participants were excluded using the same criteria as in Study 1.

2.2.2 Materials

Over 400 photos of different individuals portrayed either in full, from the waist up, or face-only, were collected from online sources (e.g., google.com) by research assistants, blind to the hypotheses, who were trained to identify each expression. Using Emotion-FACS (see Ekman & Rosenberg, 2005) and previously published guidelines regarding shame and pride expressions (e.g., Keltner, 1995; Tracy & Robins, 2007), we excluded photos that did not accurately convey each intended emotion or that conveyed any other emotion. For example, shame expressions are often misidentified as conveying sadness, so we ensured that in all shame photos targets did not show any of the prototypical facial muscle movements associated with sadness, such as lip corners turned down, or inner eyebrows raised. Pride expressions can also

convey happiness, given the presence of a smile in both displays, but we used criteria developed

by Tracy and Robins (2007) to ensure that all pride photos included the necessary features to

be reliably identified as pride and not happiness. There are two reliably recognized versions of

the pride display, and both were included (48% of pride photos showed the version with arms

raised above the head, portrayed in Figure 1; 52% showed the version with arms akimbo and

hands on hips; see Tracy & Robins, 2004; 2007). Except where noted, results held across both

versions of pride. Targets varied in age (approximately 18-49 years) and ethnicity (for both

males and females, 72% were Caucasian, 13% African-American, 10% Asian, and 5% other). All

photos can be viewed at www.ubc-emotionlab.ca/emotionattraction/.

2.2.3 Samples

Sample A

341 Canadian undergraduates (50% female; age = 16-37 years, *median* = 20; 65% Asian,

24% Caucasian, 11% other)[4] viewed and rated the sexual attractiveness of opposite-sex targets

in 80 photos (20 of each gender showing each expression; 160 photos total). Sample A also

completed the Socio-Sexual Orientation Scale-Revised (SOI-R; Penke & Asendorpf, 2008),

measuring individual differences in mating strategies. The SOI was included to test whether the

effect of emotion expressions on attractiveness varies on the basis of whether participants are

oriented toward a short-term versus long-term mating strategy; previous research suggests that

socio-sexual orientation influences numerous preferences in the mating domain (e.g.,

Waynforth, Delwadia, & Camm, 2005).

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[4] Participant ethnicity—Asian versus Caucasian—moderated the emotion x gender interaction in this sample, $F(3,885) = 5.32$, $p < .05$, but the overall pattern of effects was highly similar across ethnic groups. Only two specific differences emerged: for Asian female participants, male shame and pride did not differ, $t(104) = 1.35$, *ns*, as was the case in the full sample in Study 1; and for Caucasian male participants, female pride was less attractive than neutral, $t(33) = 2.53$, $p < .05$, replicating a finding that emerged in full Samples B and C.

Sample B

120 North American adults (80% female; age = 28-83 years, *median* = 39; 88% Caucasian, 3% Asian, 9% other)[5] were recruited through social networking websites to view and rate the sexual attractiveness of opposite-sex targets in 40 photos (10 of each gender showing each expression; 80 total), all different from those viewed by Sample A, such that a broad range of stimuli was included. In this stimulus set, we restricted the number of photos featuring targets that appeared to be professional models to 3 within each emotion condition.

By including a sample of participants who were past the age of early dating and courtship, we were able to determine whether the effects of distinct emotion expressions on attraction found in Study 1 and Study 2's Sample A generalize to individuals in a markedly different stage of romantic relationships, and beyond the preferences of the rather narrow population of undergraduates, who do not necessarily represent the majority of the world's populations (Henrich, Heine, & Norenzayan, 2010).

Sample C

396 Canadian undergraduates (64% female; age = 17-32 years, *median* = 20; 58% Asian, 30% Caucasian, 12% other)[6] viewed and rated the sexual attractiveness of opposite-sex targets in the same set of 40 photos as were viewed by Sample B. By including two samples from the same population (A and C), and using the same stimuli in two samples from different populations (B and C), we were able to determine whether any differences that emerged

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[5] Ethnicity did not moderate Sample B results.
[6] Participant ethnicity—Asian vs. Caucasian—moderated the emotion x gender interaction, $F(3,337) = 7.59$, but, as in Sample A, the overall pattern of effects was highly similar across ethnic groups. The only specific differences that emerged did *not* replicate the ethnicity effects that emerged in Sample A: (1) among Caucasian women, male happy and neutral did not differ, $t(74) = 0.54$, *ns*, as was the case in the full Sample B; (2) among Asian men, female shame and neutral did not differ, $t(79) = 0.41$, *ns*, as was the case in the full Sample B; and (3) among Asian participants, there was no gender difference for shame, $t(224) = .11$, *ns*, as was the case in Study 1. Thus, ethnicity had no clear, consistent, or predictable pattern of effects across samples or studies, and in all cases the ethnic-group-specific result that differed from the full sample replicated an effect that emerged in one of the other full samples examined.

among the three samples were due to sample differences (e.g., age) or to the particular stimuli viewed by each sample.

2.2.4 Results and Discussion

Mean attractiveness scores for each emotion expression were computed across ratings of all exemplars of each expression, separately by gender (across samples, scale αs ranged from .76-.95; interrater αs from .92-1.00). Next, to test our prediction that the effect of emotion expression on attractiveness would vary by gender, we conducted a 4 (emotion) x 2 (gender) mixed-measures ANOVA in each sample. In all three samples, an emotion x gender interaction emerged on expression-attractiveness scores, $F(3,337) = 392.38$, $F(3,114) = 88.82$, and $F(3,390) = 384.92$, for Samples A, B, and C, respectively, all ps < .001, all revealing a similar pattern (see Figures 2, 3, and 4). In Sample A, who also completed the measure of socio-sexual orientation, this interaction held controlling for SOI scores, and these scores did not interact with gender to predict any expression's attractiveness. In Sample B, which included adult participants ranging widely in age, age (based on a median split) did not moderate the gender x emotion interaction, and continuous age scores did not interact with gender to predict any expression's attractiveness. The gender x emotion interaction also held controlling for age.

Figure 2. Mean sexual attractiveness ratings of male and female displays of emotion expressions shown by 80 different male and female targets (160 total), viewed by young adults, Sample A. For male targets, all differences between expressions were significant, *p*s < .001; for female targets, all differences were significant (*p*s < .001) except for that between pride and neutral. *N* = 341. **p* < .001

Figure 3. Mean sexual attractiveness ratings of male and female displays of emotion

expressions shown by 40 different male and female targets (80 total), viewed by older adults,

Sample B. For male targets, all differences between expressions were significant, *p*s < .001,

except for that between shame and happiness; for female targets, all were significant, *p*s < .001,

except for that between shame and neutral. *N* = 120. **p* < .001.

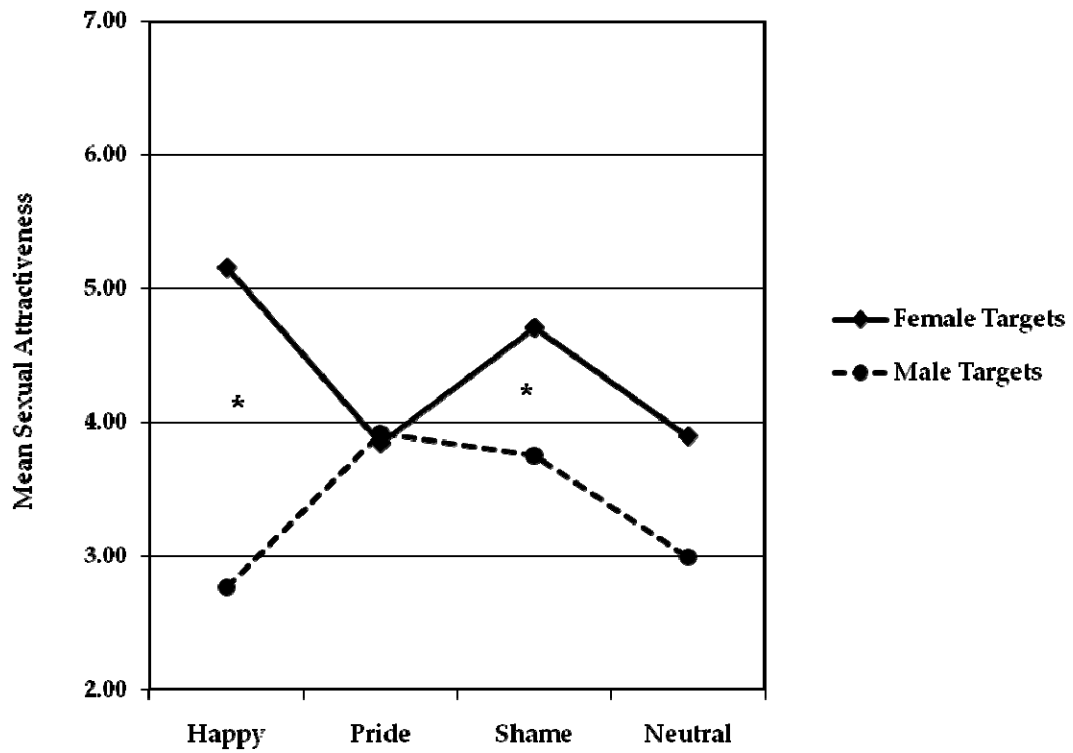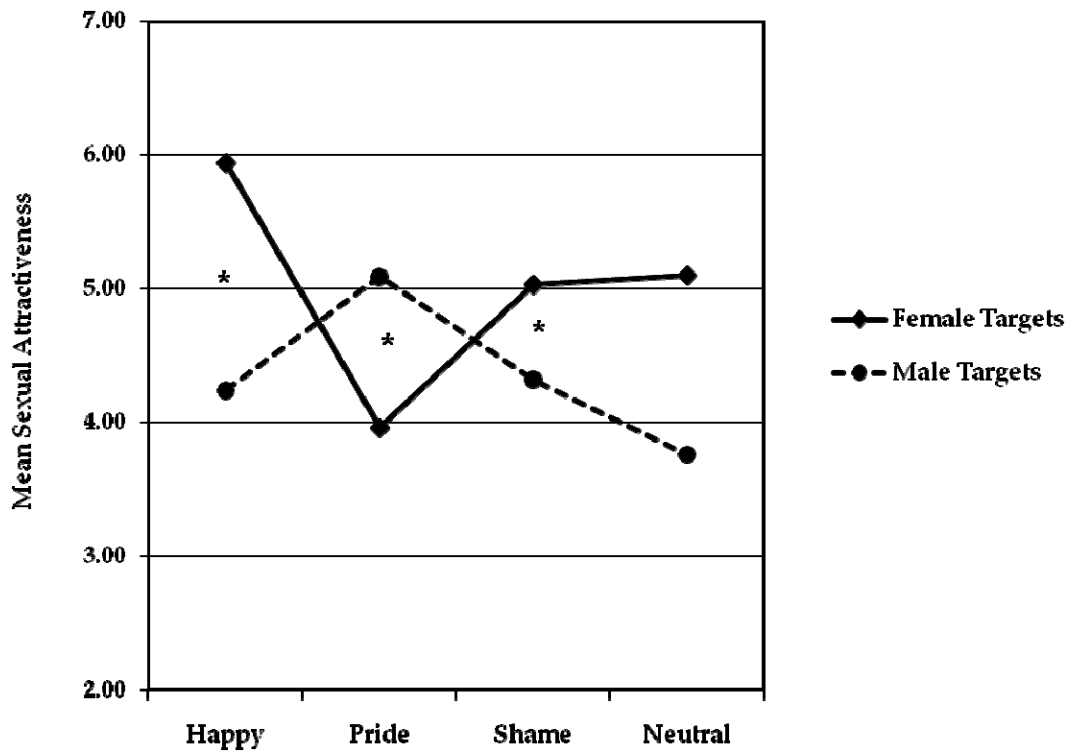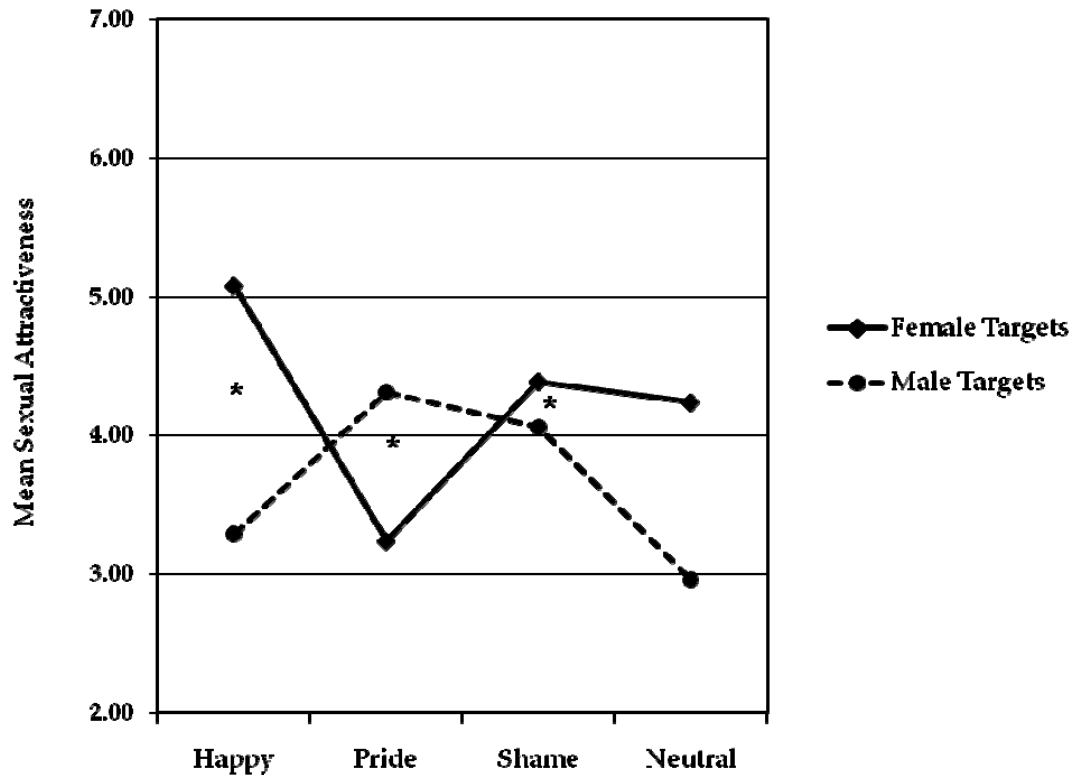**Figure 4.** Mean sexual attractiveness ratings of male and female displays of emotion expressions shown by 40 different male and female targets (80 total), viewed by young adults, Sample C. For male and female targets, all differences between expressions were significant, *p*s < .001, except for that between female shame and neutral expressions, which was significant at the *p* < .05 level. *N* = 396. **p* < .01.

To determine how the emotion-based patterns of attractiveness varied between the two genders, we next examined expression differences within each gender. Replicating Study 1, female happy displays were substantially more attractive than female pride displays, $t(171)$ = 23.28, d = 1.29; $t(37)$ = 13.96, d = 2.06; and $t(139)$ = 28.61, d = 1.70; in Samples A, B, and C, respectively; whereas the reverse occurred for male pride and happy displays, $t(168)$ = 23.83, d = 1.26; $t(79)$ = 8.16, d = 0.69; and $t(253)$ = 18.95, d = 0.80; in Samples A, B, and C; all ps < .001. Furthermore, as in Study 1, female happy expressions were the most attractive female expression in all three samples; compared to shame, $t(171)$ = 9.87, d = 0.44, $t(37)$ = 5.57, d = 0.92, and $t(139)$ = 9.17, d = 0.62; and compared to neutral, $t(171)$ = 26.98, d = 1.28, $t(37)$ = 7.85, d = 0.90, and $t(139)$ = 15.69, d = 0.78; in Samples A, B, and C, all ps < .001.

Also as predicted, male pride was the most attractive male expression in all three samples; compared to shame, $t(168)$ = 3.74, d = 0.16, $t(79)$ = 6.35, d = 0.70, and $t(253)$ = 4.15, d = 0.19[7], all ps < .001. Given that this difference, between male pride and shame, was replicated across all three samples but was small in magnitude in the college-aged samples (A and C), the absence of a significant difference in Study 1's college-aged sample is likely due to that study's relative lack of power, and that the difference in attractiveness between male pride and shame is small, especially when these displays are judged by female undergraduates. Male pride and shame were both more attractive than neutral; ts(168) = 15.42 and 22.26, ds = 0.98 and 0.97; ts(79) = 11.79 and 5.89, ds = 1.20 and 0.48; and ts(253) = 23.59 and 19.64, ds = 1.14 and 0.99; for comparisons of male neutral with pride and shame in Samples A, B, and C, respectively; all

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[7] Separately examining the two versions of pride, two differences emerged: Sample A women rated male shame more attractive than the male pride version with arms raised, $t(168)$ = 12.86, d = 0.68, and Sample C women rated male shame more attractive than the male pride version with arms akimbo, $t(253)$ = 2.81, d = 0.12, both ps < .01. Given that these variations occurred for two different versions of pride, there is likely little difference between the versions' attractiveness, but, consistent with overall findings, male shame is apparently not substantially less attractive than male pride, regardless of which pride version is shown.

*p*s < .001.[8] In the younger adult Samples A and C, male shame was more attractive than

happiness, $t(168) = 16.80$, $d = 1.04$; and $t(253) = 13.16$, $d = 0.64$; both *p*s < .001. Although this

effect was not predicted, it replicates a non-significant trend from Study 1. In the older adult

Sample B, male shame and happy displays did not differ, $t(79) = 0.66$, *ns*. This divergence

between samples suggests that the tendency to find shame-displaying men especially attractive

may be characteristic of younger, college-age women in particular. However, in all three

samples male happy displays were one of the least attractive expressions. Indeed, in Sample A

happy displays were the least attractive male expression, and in Samples B and C male

happiness was more attractive only than neutral, with differences relatively small in magnitude

[for happy-neutral comparisons in Samples A, B, and C, $t(168) = 6.68$, $d = 0.27$; $t(79) = 5.11$, $d =$

0.40; and $t(253) = 6.89$, $d = 0.30$; all *p*s < .001]. This divergence between samples—whether

happy or neutral displays were the least attractive male expression—may be due to something

idiosyncratic about the targets displaying these expressions in the two stimulus sets, given that

the pattern was more similar among the two samples that viewed the same stimuli (B and C).

As predicted, female shame was more attractive than female pride in all three samples,

$t(171) = 14.04$, $d = 0.85$; $t(37) = 6.28$, $d = 1.13$; and $t(139) = 15.74$, $d = 1.07$; in Samples A, B,

and C, all *p*s < .001 (though, this difference did not hold in Sample B for the version of pride

with arms akimbo, $p = .28$). Given this consistency across samples and stimuli, the low ratings

received by the shame-displaying female target in Study 1 were likely due to something

idiosyncratic about that target as she posed shame. In Samples A and C, female shame was also

more attractive than neutral, $t(171) = 17.48$, $d = 0.83$, $p < .001$; and $t(139) = 2.32$, $d = 0.14$, p

< .05; in Sample B female shame and neutral did not differ, $t(38) = 0.48$, *ns*, but given the small

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[8] The pride-neutral difference did not hold in Sample A when examining the version of pride with arms raised only,
$p = .53$.

effect size in Sample C, who viewed the same images as Sample B, the failure to replicate in the older adult sample may not be meaningful. The least attractive female expression in all three samples was pride; although it did not differ significantly from neutral in Sample A, $t(171) = 1.02$, *ns*, it did in Samples B, $t(38) = 9.91$, $d = 1.28$, and C, $t(139) = 18.51$, $d = 1.00$; both $ps < .001$.

Comparing the attractiveness of each expression across gender, in all three samples happy, shame, and neutral expressions were more attractive in women than men, $t(339) = 23.86$, $d = 2.61$, $t(116) = 7.52$, $d = 1.54$, and $t(392) = 14.64$, $d = 1.56$, for happy comparisons in Samples A, B, and C, all $ps < .001$; $t(339) = 8.51$, $d = 0.92$, $t(116) = 3.29$, $d = 0.66$, and $t(392) = 2.67$, $d = 0.28$, for shame comparisons, all $ps < .01$; and $t(339) = 8.98$, $d = 0.99$, $t(116) = 6.31$, $d = 1.31$, and $t(392) = 12.17$, $d = 1.28$, for neutral; all $ps < .001$. In Sample A, there was no gender difference for pride, $t(339) = 0.63$, *ns*, as was the case in Study 1; but in Samples B and C pride was more attractive in men than women, $t(116) = 5.64$, $d = 1.14$; and $t(392) = 8.04$, $d = 0.88$; though, in both cases, this difference held only for the version of pride with arms raised, both $ps < .001$. Examining only pride displays with arms akimbo, there was no difference between male and female ratings. Combined with the absence of a difference, in Sample B, between female akimbo-pride and shame, these results suggest that this version of the pride expression, when shown by women, is particularly attractive—likely due to the fact that holding one's arms akimbo with hands on hips increases the appearance of chest expansion. Indeed, in all three samples, women showing the akimbo-pride display were judged more attractive than those showing the arms-up version, $t(171) = 20.56$, $d = 1.10$; $t(37) = 9.92$, $d = 1.53$; and $t(139) = 15.27$, $d = 1.06$; all $ps < .05$.

Replicating Study 1, collapsing across all expressions, women were judged more attractive than men, $t(339) = 10.76$, $d = 1.16$; $t(116) = 3.60$, $d = 0.74$; and $t(392) = 5.31$, $d = 0.57$;

in Samples A, B, and C, all $ps < .001$. To determine whether this overall gender difference contributed to the absolute gender differences that emerged for happy, shame, and neutral displays, we replicated the between-gender t-tests comparing ratings of each expression controlling for ratings of neutral expressions, under the assumption that these judgments would account for variance attributable to the broader gender difference. (The between-subjects design of Study 1 prohibited us from running similar analyses there). Controlling for ratings of neutral displays, the absolute gender differences that emerged for happy and pride displays held; all $ps < .01$. In contrast, the absolute gender difference in shame displays were reduced to non-significance in both Samples A and B when controlling for neutral ($ps = .052$ and $.15$), and reversed direction in Sample C, such that male shame became more attractive than female shame in this group, $F(1,391) = 56.92$, $d = 0.82$, $p < .01$, replicating Study 1. Thus, across the 2 studies and four samples, it seems reasonable to conclude that the absolute gender difference in happy displays is not due to the broader gender difference in attractiveness ratings, but that there may be no overall, cross-sample absolute gender difference in shame displays, when accounting for the broader gender difference in attractiveness ratings. This further supports the conclusion that male shame displays are not inherently unattractive.

2.3 Summary of Findings

2.3.1 Happiness

Although we predicted a gender difference in the relative attractiveness of happy and pride expressions, we expected a larger absolute gender difference for pride displays than happy, and we did not expect the very large gender difference for happy expressions that emerged across studies and samples, and which was both absolute (happy women are more

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attractive than happy men) and relative (female happy expressions are more attractive than other female expressions, and male happy expressions less). Previous studies have demonstrated a positive effect of happy displays on female attractiveness (Mueser et al., 1984; Penton-Voak & Chang, 2008; Schulman & Hoskins, 1986), but, to our knowledge, this is the first research to demonstrate a negative effect of male happiness displays on male attractiveness. This gender difference may be due to happy expressions' appearance of femininity and low dominance (especially when shown by men; Becker et al., 2007; Hareli, Shomrat, & Hess, 2009), which would increase happy women's apparent gender-norm consistency, and thus attractiveness, but decrease happy men's (Brown et al., 1986).

2.3.2 Pride

Similarly, the gender difference in the relative attractiveness of pride expressions, which held across samples and studies, is consistent with both evolutionary and gender-norm principles. Given its associations with high-status (Shariff & Tracy, 2009; Tiedens, Ellsworth, & Mesquita, 2000; Williams & DeSteno, 2009), the pride expression may convey heightened masculinity; its prototypical behavioral components of expanded chest and generally large appearance are notably male features, and similar features, such as upper-body strength, have been found to increase masculinity and male attractiveness (Li & Kenrick, 2006). Furthermore, by conveying high-status, pride may signal a man's competence and ability to provide for a partner and offspring; in contrast, from an evolutionary perspective, the mate value of a high-status woman is more ambiguous. Though a woman high in status may be well equipped to attain resources for her partner and children, previous research suggests that men evolved to seek female partners who were best equipped to bear and raise children, but not necessarily to

support them (Buss, 2008). Our finding of relatively low attractiveness ratings for female pride displays is consistent with this account; however, the absence of an absolute gender difference in pride attractiveness in Study 1 and Study 2 Sample A suggests that contemporary men do not judge pride-displaying women as unambiguously unattractive—particularly when women display pride in the akimbo-arms position—but, rather, as somewhat less attractive than women displaying certain other expressions.

2.3.3 Shame

The effect of shame expressions on attractiveness is more complex. In general, female shame displays fell between female happy and female pride (and above neutral) on attractiveness ratings; this finding fits with the assumption that shame's low-status and submission connotations increase its apparent femininity, and thus the attractiveness of shame-displaying women. The positive impact of shame displays on female attractiveness also may be due to shame's signaling of the expresser's respect for social norms and her awareness that she has violated them (Gilbert, 2007). This appeasement message may indicate trustworthiness, a trait previously found to increase women's attractiveness when conveyed by facial expressions (Todorov, Said, Engell, & Oosterhof, 2008). The appeasement account also may explain the high levels of attractiveness of male shame displays. In all samples, shame-displaying men were equally or more attractive than men displaying neutral, happy, and, in Study 1, pride expressions. Given that gender norms cannot account for the attractiveness of male shame (the low-status/high social-sensitivity signal is gender atypical), shame's communication of group commitment may be what accounts for its relative attractiveness in men. This also fits with Zahavi and Zahavi's (1997) handicap principle of evolved signals; the expression's costliness (its low-status signal could endanger expressers) may simultaneously indicate its sincerity, leading

women to place greater trust in men who show shame than, perhaps, those who show happiness. It is important to bear in mind, however, that the tendency for shame expressions to be recognized at a somewhat lower rate than happy or pride displays, and to be confused with expressions of sadness and general self-consciousness or shyness, may also have contributed to these effects. For example, if either women or men interpreted shame displays as conveying sadness, and thus indicating an individual's need for comfort and support, they may have found them attractive for this reason, given previous research suggesting that sympathy breeds attraction (Cunningham, et al., 1990).

The only noteworthy finding that did not replicate across samples in Studies 1 and 2 pertains to shame. When shown by men, the expression appears to be particularly attractive to *younger* women (as was evidenced by Study 1 and Study 2 Samples A and C). In contrast, women over the age of 30 tended to rate shame- and happy-displaying men as equally attractive (and both more so than neutral). This discrepancy is consistent with evolutionary accounts of the attractiveness of shame; college-age women are closer to the age at which evolved mating preferences are most reproductively relevant, so to the extent that such preferences shape judgments, they are more likely to do so in these women than those who are nearing or at the end of their reproductive life cycles (Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). It is also possible that the "troublemaker" message implied by a shame expression (i.e., shame informs observers that a transgression was committed) is less appealing to older women who have learned to distrust transgressors, despite the possible appeal of their trust-signaling appeasement displays. However, because the older and younger samples were recruited from different populations, other demographic factors may underlie this distinction, making this an important issue to be addressed in Studies 3-5.

More broadly, given that shame displays are known to convey low-status (Shariff & Tracy, 2009), and that women tend to view status as an important characteristic when evaluating the attractiveness of a potential partner (Li, & Kenrick, 2006), it is somewhat surprising that the male shame expression was relatively attractive to women viewers across three different samples. For this reason, we conducted three additional studies, described in the next chapter, to address the question of what might account for young North American women's attraction to shame-displaying men.

Chapter 3. The Attractiveness of Male Shame

A growing body of evidence suggests that the nonverbal expression of shame is cross-culturally recognized and displayed, supporting the suggestion that this expression is likely to be evolved (Haidt & Keltner, 1999; Izard, 1971; Tracy & Robins, 2008; Tracy & Matsumoto, 2008). These displays likely originated from more ancient poses, seen across a wide range of species, which function to appease others by signaling a displayer's submission (Keltner, Young, & Buswell, 1997). Displaying a submissive pose rather than engaging in a costly fight spares displayers from a loss of valuable time and energy, which could be devoted to other pursuits such as resource and mate acquisition and retention (Gangestad & Simpson, 2000). Throughout humans' evolutionary history, the failure to submit to a stronger or otherwise more powerful adversary would have major costs, including survival (MacLean, 1990) thus, several researchers have speculated about the evolutionary origins of the shame display in humans; according to these accounts, by displaying the expression in response to a failure or social transgression, expressers communicate their awareness of their norm violation, and the display serves an appeasing function much like the submission display seen in other species (Gilbert, 2007; Keltner, 1995; Martens, Tracy, & Shariff, 2012). In other words, by displaying shame, the expresser communicates his or her respect for the social norms he/she violated, and his/her regret for violating them and this message may protect the transgressor from overly negative social appraisals and perhaps even physical punishment (Keltner, Young, & Buswell, 1997), particularly in comparison to the alternative of committing a social transgression and *not* showing shame, and thus being viewed as an untrustworthy group member.

Thus, by communicating this acknowledgement and implicit apology, shame displays may help transgressors avoid social exclusion, as well as forfeiting their claim to shared group

resources (Gilbert, 2007). In humans, the appeasing submission signal seems to have shifted to a signal of one's willingness to cooperate and defer to other group members (Gilbert 2007; Fessler, 2007). In sum, displaying shame may have fitness-enhancing benefits, which would make shame displays a visible marker of good genetic quality, and thus high mate value. From an evolutionary perspective, an expression that communicates high mate value should increase the expresser's attractiveness.

However, though attractiveness judgments are guided by evolved mating strategies (Buss, 1987), the influence of these strategies also varies depending on social and cultural factors (Tovee, Swami, Furnham, & Mangalparsad, 2006; Li, Valentine, & Patel, 2010). Thus, it is possible that our findings from Studies 1 and 2, demonstrating the attractiveness of male shame displays, are the result of Western cultural variation in the importance placed on certain mate-relevant characteristics, rather than a universal sexual preference for markers of genetic fitness. Indeed, it is important to bear in mind that shame has been found to be strongly associated with low status, both implicitly and explicitly (Shariff & Tracy, 2009; Shariff, Tracy, & Markusoff, in press), and, in a survey examining over 9,000 women and men in 37 cultures worldwide, women across cultures showed a greater preference for high-status partners compared to men (Buss et al., 1989; 1990). However, a re-examination of these data suggests that women from cultures with reduced reproductive freedom (i.e., little access to birth control or abortion) and few educational opportunities for women place greater emphasis on status as an indicator of a male partner's attractiveness, compared to women from cultures with greater access to these liberties (Kasser & Sharma, 1999). Counter to the argument that women universally prefer high-status partners because mating with individuals who can readily accumulate valuable resources historically conferred a reproductive advantage, these findings suggest that, in fact,

this preference may be the result of particular features of a woman's local ecology. Specifically, when a woman can independently acquire the resources needed to support herself and her offspring, she may become less concerned with finding a high-status mate who will do so for her. Thus, given that shame is a low-status signaling emotion, a socio-cultural account of its attractiveness would suggest that displaying shame would have a less negative impact on male attractiveness in cultures that afford greater opportunities for women to succeed financially on their own. Conversely, male pride displays, which signal high-status, might likewise be more attractive in cultures where women have less access to such resources, making it relatively more important that they seek high-status mates.

In sum, there exist two directly competing hypotheses regarding the attractiveness of male shame. From one perspective, we would predict that male shame is attractive universally because it conveys fitness-enhancing traits (e.g., group commitment, respect for social norms, and avoidance of physical confrontation) and thus signals high genetic quality. However, from a socio-cultural perspective, we would predict that male shame is attractive only in certain cultures where women have sufficient economic and reproductive independence to be able to disregard a man's status in judging his attractiveness. In the current research we pit these competing hypotheses against each other using several methodological approaches.

3.1 Methodological Approach for Studies 3 and 4

A growing body of evidence indicates that women's sexual preferences vary across the menstrual cycle, in ways consistent with the suggestion that women are most attentive to markers of "good genes" in potential mates during the follicular phase, when conception is most likely (the days immediately preceding and during ovulation; Baker & Bellis, 1995; Gangestad and Thornhill, 1998; Regan 1996; Penton-Voak & Perrett, 2000). Thus, if the male

shame expression is a reliable signal of high genetic quality, then women at this highest-risk for conception stage of the cycle should find shame-displaying men more attractive, compared to women who are at low-conception-risk stages. In contrast, if male shame is indicative of poorer genetic fitness, then women at high conception risk should be *less* attracted to shame displayers, as mating with these men during the period of ovulation could be maladaptive, given that shame is likely to be an evolved signal of low status.

Thus, in Study 3 we tested whether women who are at high risk for conception, based on their current stage of the menstrual cycle, were more attracted to men displaying shame compared to women at a lower risk for conception. In addition, we tested whether women's risk of conception (based on cycle) affected their attraction to men displaying other emotion expressions (pride, happiness, and neutrality), to determine whether any shift in preference for shame-displaying men could be attributed to a more general tendency for women at high-conception risk to judge male targets as more attractive, compared to women at low risk.

In a separate literature, a large body of work has used a cross-cultural approach to demonstrate the universality of certain psychological phenomena (Norenzayan & Heine, 2005). Inherent in this approach is the assumption that if a particular psychological preference is found across maximally divergent cultural groups, then this preference is likely to be universal, and thus may reflect evolutionary processes. From this perspective, if male shame displays are judged as attractive by women living in a cultural setting with markedly different customs and values it would provide support for the genetic fitness explanation of the attractiveness of male shame. Conversely, if there is cultural variation in the attractiveness of male shame, such that women from cultures with different attitudes about the importance of men attaining and

demonstrating high status do not find male shame displays attractive, it would support the socio-cultural explanation.

Thus, in study 4 we tested whether American women were more attracted to men displaying shame compared to women from India; this study also tested whether culture influenced women's attraction to male displays of other expressions (pride, happiness, and neutrality), to determine whether any cultural difference in preference for shame-displaying men could be attributed to a more general cultural difference in women's judgments of male attractiveness. We chose to compare American women with Indian women for several reasons. First, India is one of the very few non-Western countries where researchers have examined recognition of the shame display, and produced findings suggesting that shame is recognized equally well by Indians and North Americans (Haidt & Keltner, 1999). Thus, any cultural differences in the attractiveness of male shame found between the U.S. and India cannot be attributed to cultural differences in recognition of the display. Second, there are major cultural differences between India and North America in the way that shame is viewed and evaluated, allowing for a stringent test of the universality hypothesis (Norenzayan & Heine, 2005). In North American cultures, shame is considered a "hidden" emotion which is typically not discussed or even acknowledged by people experiencing it (Lewis, 1971; Scheff, Retzinger, & Ryan, 1989), and has been rated the most painful emotion to experience (Lazarus, 1971). Its expression tends to be suppressed by North Americans even in situations of major public failure (Tracy & Matsumoto, 2008). In contrast, in India, as in many other Asian cultures, shame is a highly valued emotion, which is seen as essential to social harmony and "making the world move along" (see Rozin, 2003, p. 278). Third, women in India tend to have considerably fewer educational opportunities, and a lesser representation in the labor force, compared to women

in the U.S. (*United Nations Human Development Report,* 2011), making Indian women more likely

to value high-status in potential mates (Kasser & Sharma, 1999). Finally, given the major

presence of Indians on data-collection Internet websites (e.g., Amazon Mechanical Turk), it is

relatively easy to collect reliable questionnaire data from Indians, compared to individuals from

most other non-Western countries.

In both Studies 3 and 4, we also assessed individual differences in mating strategies using

the Socio-Sexual Orientation Scale-Revised (SOI-R; Penke & Asendorpf, 2008), in order to

control for individual differences in participants' orientation toward a short-term versus long-

term mating strategy. Previous research suggests that these strategies influence many

preferences in the mating domain (including preferences for masculinity; e.g., Waynforth,

Delwadia, & Camm, 2005) and can vary across culture and ovulatory stage (Schaller & Murray,

2008; see Haselton & Gangestad, 2006). Thus, to ensure that any effects found could not be

attributed to differences in strategy, SOI-R scores were treated as a covariate in all between-

subjects analyses in Studies 3, 4 and 5. However, in all cases except where noted, reported

effects held when SOI-R scores were not statistically controlled.[9]

3.2 Study 3

3.2.1 Participants and Procedure

73 American women (age=18-42; 77% Caucasian, 10% Asian, 13% Other) were

recruited from Amazon Mechanical Turk™ (see Buhrmester, Kwang, & Gosling, 2011) and

participated online in exchange for monetary compensation. All participants were heterosexual

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[9] One participant who's SOI-R score was 3.50 standard deviations above the mean was excluded from analyses in Study 5.

(27 additional women who were not heterosexual were excluded, given our research goals of examining heterosexual attraction).

All participants indicated that they were neither pregnant nor using any form of hormonal contraception (see Haselton & Gildersleeve, 2011; 5 additional women who reported using hormonal contraception and 2 additional women who reported being pregnant were excluded from analyses). Furthermore, all participants reported that they had menstruated within 40 days of the experiment, and experienced regular menstrual cycles (see Haselton & Gildersleeve, 2011; 6 additional women who reported not having menstruated in 40 or more days, and 15 additional women who reported that they did not experience typical menstrual cycles were excluded from analyses).

Women were shown a calendar of the current and previous 2 months and asked to use it in facilitating their response to the question: "How many days has it been since the onset of your last period of menses?" Following the 28-day model of the menstrual cycle (Gangestad, & Thornhill, 1998), participants were assigned to one of two conception-risk categories. Category assignment was based on number of days since the onset of their last period of menses: "high conception risk" (6-14 days since onset; n=25), or "low conception risk" (all other days; n=48)[10].

To address concerns raised in previous research regarding the validity of assessing menstrual history via self-report (Bean, et al., 1979; but see Baker, Denning, Kostin, & Schwartz, 1998), after reporting the date of their most recent menses onset, participants were asked, "Within how many days are you 100% confident in your above estimate?"; they responded

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[10] Some previous studies examining effects of cycle stage have excluded women who are currently menstruating or premenstrual (days 0-5 and 24-28 days since onset) to rule out the possibility that psychological effects found (e.g., mood effects) are due to hormonal changes associated with the menstrual phase or premenstrual symptoms (see Haselton & Gildersleeve, 2011). Here, we saw no reason to exclude these women (n=29); however, all reported effects hold if these women are excluded from analyses.

using a scale ranging from 1 to 7, where 1 indicated "0 days (I'm 100% confident in my answer)", 2 indicated "1 day", 3 indicated "2 days", 4 indicated "3 days", 5 indicated "4 days", 6 indicated "5 days", and 7 indicated "More than 5 days (I'm not very confident in my above answer)". All participants were excluded who responded with 7 (n=3), as well as all participants for whom category membership could not be determined (high vs. low conception risk) with 100% certainty (n= 11). Specifically excluded, for example, was any participant who indicated that her last menses began 12 days ago but that she was 100% confident of that estimate within 3 days. In such a case, it was assumed that her last period began 9-15 days ago, and thus that she could *not* be safely included in either the high-risk (days 6-14) or low-risk (days 0-5 and 15-28) category. In contrast, any participant who indicated that her last menses began 10 days ago and was 100% confident within 3 days would be included, because it could be assumed that her period began 7-13 days ago, placing her firmly within the high-risk category (days 6-14).

3.2.2 Materials

Participants viewed photos, online, of 40 men displaying each of four expressions: shame, happiness, pride, and neutral (10 photos of each expression), these were the same 40 photos as were shown to female participants of Samples B and C in Study 2. Targets varied in age (approximately 18–49 years) and ethnicity (65% were Caucasian, 8% African American, 10% Asian, and 17% other). Photos were presented in a randomized order. For each photo, participants responded to the question, "How sexually attractive do you find this person?" using a 9-point scale ranging from 1 (Very Unattractive) to 9 (Very Attractive).[11] Attractiveness

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[11] One additional participant was excluded for giving a rating of '1' to 38 of the 40 target photographs

ratings were completed after women were asked questions designed to assess their current risk for conception.

3.2.3. Results and Discussion

Mean attractiveness scores for each emotion expression were computed across attractiveness ratings of all exemplars of each expression (interrater αs from .77-.84)

Replicating the findings of Study 2 Sample C (the younger North American sample), an examination of the results across ovulatory stage demonstrated that women found shame displaying men to be significantly more attractive than happy-displaying men, $t(72)=5.01$, $d=0.53$, and neutral-displaying men, $t(72)=11.56$, $d=1.04$ both $ps<.001$. Also replicating previous findings, there was no significant difference between judgments of shame-and pride displaying men, $t(72)=0.95$, $p=.34$, Pride was judged as significantly more attractive than happiness, $t(72)=6.97$, $d=0.60$ and neutrality, $t(72)=11.40$, $d=1.13$, both $ps<.001$. Male happiness displays were judged as more attractive only than the neutral expressions, $t(72)=4.92$, $p<.001$, $d=0.49$.

To examine whether the effects of emotion expressions on attractiveness varied across ovulatory stage, we next conducted a 4 (emotion) x 2 (conception risk) mixed measures ANCOVA (controlling for SOI-R). There was no main effect of conception risk on attractiveness judgments overall, $F(1, 70)=1.26$, $p=.27$, suggesting that women at high conception risk did not show a general tendency to find men more attractive regardless of their emotional display. However, there was a significant emotion x conception risk interaction, $F(3, 68)=2.96$, $p=.038$, indicating that the effect of conception risk on attractiveness varied by emotion expression. To understand this interaction, we next examined the effect of conception risk on attractiveness judgments of each expression.

Specifically, we conducted four ANCOVAs (controlling for SOI-R), with level of conception risk as the fixed factor, predicting attractiveness judgments for each expression separately. This revealed a significant effect of conception risk for shame-displays; men expressing shame were judged as less attractive by women who were at a high risk for conception, compared to those at low risk, $F(1,70)=5.60$, $p=.02$. In contrast, for pride, happiness, and neutrality, no significant effects of conception risk emerged, $F(1,70)=0.68$, $p=.412$, $F(1,70)=0.073$, $p=.79$ and $F(1,71)=0.124$, $p=.73$, respectively (see Figure 5).
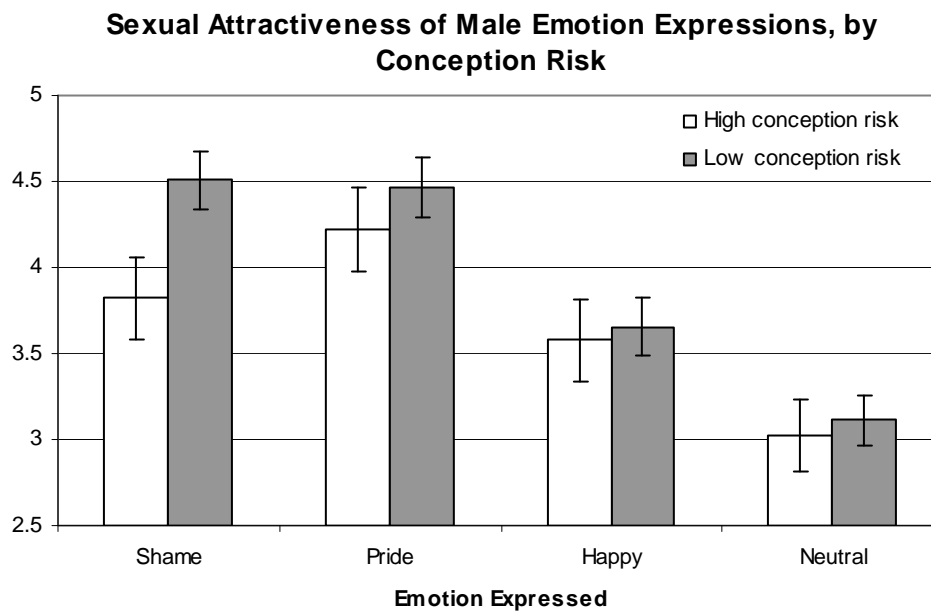

Figure 5. Estimated marginal mean sexual attractiveness ratings of emotion expressions (controlling for SOI-R) shown by 40 different men, viewed by women at high and low conception risk. Comparing women at high versus low conception risk, the only significant difference that emerged was in the attractiveness of male shame, $F(1,70)=5.60$, $p=.02$. N=73

Thus, contrary to the hypothesis that, if shame displays signal good genes, women at high-risk for conception should find them particularly attractive, women at high risk for conception in fact found shame-displaying men particularly unattractive. This suggests that shame displays may signal poor-quality genes, such that women who are most likely to conceive benefit from *not* mating with these men. Given that the effect found was a reduced level of attraction reported by high-risk women, this finding cannot be attributed to a general tendency for high-risk women to find men more attractive. In addition, this effect seems to be specific to the shame expression.

These results lend no support for the explanations that male shame is attractive because it indicates good genetic fitness, and instead suggest that displaying shame may actually be an indicator of poor genetic fitness. Thus, the current and previous finding that North American women find shame-displaying men attractive may be a byproduct of specific cultural values present in a particularly North American ecology. To test this possibility, we next conducted Study 4, in which we tested for cultural differences in the attractiveness of male shame.

3.3 Study 4

3.3.1 Participants, Materials and Procedure

Participants (*N*=228) were the 137 American women who were recruited for Study 3 (age=18-42; 73% Caucasian, 10% Asian, 17% Other), including those who had been excluded from Study 3 due to ovulatory stage, irregular menstrual cycles, hormonal birth control use, or pregnancy, and a new sample of 91 Indian women (age=18-39; 100% Indian) who volunteered to participate in exchange for monetary compensation on Amazon Mechanical Turk™ (AMT).

All participants were heterosexual (42 additional women who were not heterosexual were excluded, given our research goals of examining heterosexual attraction).

All participants viewed the same photos, online, as were used in Study 3: 40 men displaying each of four expressions: shame, happiness, pride, and a neutral control (10 males showing each expression). Photos were again presented in a randomized order and for each photo, participants responded to the question, "How sexually attractive do you find this person?" using a 9-point scale ranging from 1 (Very Unattractive) to 9 (Very Attractive). [12]

3.3.2 Results and Discussion

Again, mean attractiveness scores for each emotion expression were computed across ratings of all exemplars of each expression (interrater αs from .81-.88).

In order to examine whether the effect of emotion expression on attractiveness varied across cultural background, we conducted a 4 (emotion) x 2 (cultural identity) mixed measures ANCOVA (controlling for SOI-R) predicting mean attractiveness ratings. No main effect of culture emerged, $F(1, 210)=0.79$, $p=.38$, suggesting that Indian and American women do not differ in the extent to which they judge men sexually attractive. However, there was a significant interaction between emotion expression and culture, $F(3, 208)=10.17$, $p<.001$, suggesting that the effect of emotion expressions on attractiveness varied by culture. To better understand this difference, we next examined results separately for the U.S. and Indian samples.

In the U.S. sample, we again replicated previous findings: Shame displays were judged as more attractive than happy, $t(134)=6.59$, $d=0.47$, and neutral displays, $t(134)=11.93$, $d=0.83$, both ps<.001; however, shame-displaying men again did not differ significantly from pride-

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[12] One additional participant was excluded for giving a rating of '1' to 39 of the 40 target photographs

displaying men, $t(135)=1.48$, $d=0.11$, $p=.14$. Pride-displaying men were judged as significantly more attractive than happy-displaying men, $t(134)=7.37$, $d=0.55$, and neutral-displaying men, $t(134)=12.13$, $d=0.89$ both $ps<.001$. Finally, happy displays were judged as significantly more attractive than neutral, $t(136)=4.63$, $p<.001$, $d=0.34$, replicating a finding that emerged in Samples B and C of Study 2.

In contrast, in the Indian sample, a notably different pattern emerged. Here, male shame-displayers were judged as significantly less attractive than pride-displayers, $t(90)=7.06$, $d=0.67$, $p<.001$, and no more attractive than happy-displayers, $t(90)=1.38$, $d=0.15$, $p=.17$. However, shame-displayers were again more attractive than neutral-displayers, $t(90)=4.44$, $d=0.40$, $p<.001$. Pride-displayers were more attractive than happy, $t(90)=8.86$, $d=0.57$, and neutral-displayers, $t(90)=13.7$, $d=1.09$; both $ps<.001$ and happiness was significantly more attractive than neutral among Indians as well, $t(90)=7.09$, $d=0.47$, $p<.001$.

To more directly test the socio-cultural account hypothesis that the attractiveness of male shame displays should vary across cultures, we next performed four ANCOVAs with cultural background as the fixed factor, controlling for SOI-R, predicting the attractiveness of each expression separately (see Figure 6). Results revealed a significant effect of culture for shame; Indian women judged men displaying shame as significantly less attractive than did American women, $F(1,210)=4.59$, $p=.03$. Interestingly, a significant culture effect also emerged for pride, but in the opposite direction; Indian women judged men displaying pride as significantly more attractive than did American women, $F(1,210)=6.61$, $p=.01$. [13] No cultural differences emerged for happiness $F(1,210)=2.40$, $p=.12$, or neutrality $F(1,210)=0.64$, $p=.43$.

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[13] This effect became marginally significant when SOI-R scores were not statistically controlled, $F(1,226)=3.70$, $p=.056$.

Sexual Attractiveness of Male Emotion Expressions, by Culture
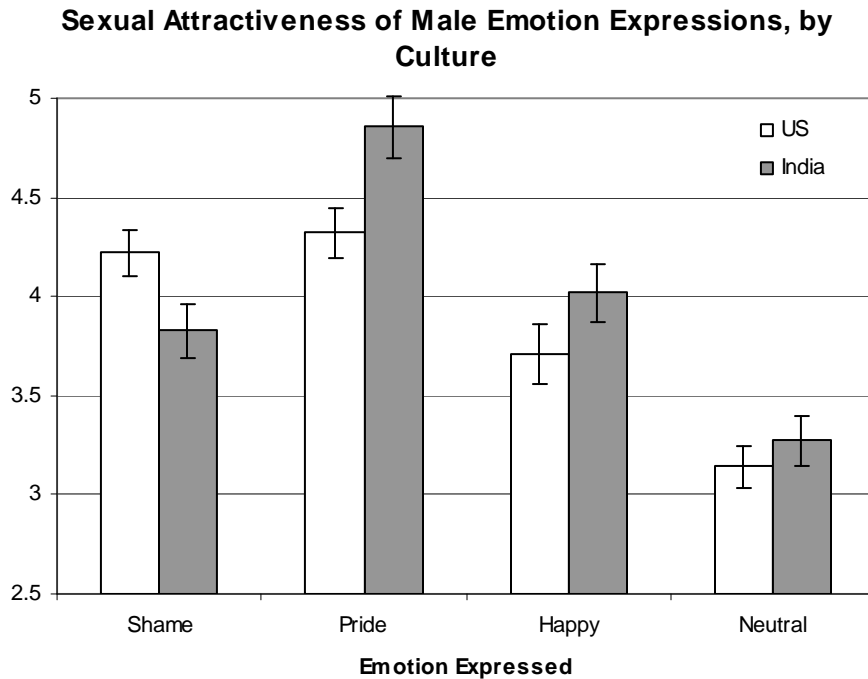
Figure 6. Estimated marginal mean sexual attractiveness ratings of displays of emotion expressions (controlling for SOI-R) shown by 40 different men, as judged by women in the United States and India. Among Indian women, male shame and happiness did not differ significantly from each other, but all other apparent differences between expressions were significant, $ps<.001$; among U.S. women, male pride and shame did not differ significantly, but all other apparent differences between expressions were significant, $ps<.001$. Comparing judgments by women's cultural identity, the only significant differences that emerged were for the attractiveness of male shame, $F(1,210)=4.59$, and male pride, $F(1,210)=6.61$, both $ps<.05$. $N=228$.

Thus, contrary to the hypothesis that, if shame displays signal good genes, women should universally find these displays attractive, Indian women found shame-displaying men relatively unattractive compared to American women. Given that there was no overall cultural difference in attractiveness ratings across targets, this result cannot be attributed to broader cultural differences in women's ratings of male attractiveness. Rather, this difference seems to be specific to the shame and pride displays—the two displays that convey status information.

3.4 Interim Summary

Studies 1 and 2 revealed that North American women are attracted to men who display shame, compared to men displaying several other expressions. The goal of Studies 3 and 4 was to test competing explanatory accounts for this unexpected finding; specifically whether it is likely to be an effect of a universal psychological mechanism which maximizes genetic fitness, or of socio-cultural learning particular to an ecology which places a lessened emphasis on status in potential male partners. The findings of these two studies provide consistent support for the socio-cultural explanation. If women evolved to find male shame displayers attractive because shame signals high genetic quality, then women most attuned to indicators of "good genes" (i.e., those in the follicular phase of the menstrual cycle; see, Gangestad and Thornhill, 1998) would be expected to demonstrate a marked attraction to men displaying shame. However, Study 3 showed that these women in fact judged shame-displaying men to be *less* attractive than did women at low risk for conception, suggesting that the shame display is indicative of poorer genetic fitness, perhaps because it communicates low-status (Shariff & Tracy, 2009).

Using a different method, Study 4 examined whether the previously found shame-attractiveness effect might be unique to the North American culture in which it emerged, by

comparing attractiveness judgments between North American and Indian women. Results were consistent with this expectation; a cultural difference emerged in the attractiveness of male shame displays, such that Indian women reported significantly less attraction to these men, compared to American women. Interestingly, the reverse pattern emerged for male pride displays; American women found these men less attractive than did Indian women.

Given that the pride and shame expressions signals high and low status respectively, these findings may be at least partly attributed to Indian women placing greater importance on a man's status, as an indicator of his attractiveness, compared to American women. This assumption is consistent with correlational studies showing an attenuated preference for high-status men among women from countries where women have greater access to economic resources (Kasser & Sharma, 1999). In Study 5 we used an experimental approach to directly test this possibility.

3.5 Study 5

3.5.1 Participants and Procedure

36 American and 26 Indian women (age=19-61) were recruited through Amazon Mechanical Turk™ (AMT) to participate in an online study, in exchange for monetary compensation. All participants were heterosexual (13 additional women who were not heterosexual were excluded from analyses, given our research goals of examining heterosexual attraction). Participants were randomly assigned to view a photo of a male target dressed as either a businessman (high-status target) or a homeless man (low-status target). While viewing the photo, participants responded to the question, "How sexually attractive do you find this person?" using a 9-point scale ranging from 1 (Very Unattractive) to 9 (Very Attractive).

3.5.2 Materials

The photos used in both conditions featured the same Caucasian male target in his twenties, from the waist up, displaying a neutral expression. In the "businessman" photo, the man wore an expensive blazer and button-down shirt, was clean-shaven, and had styled hair. In the "homeless man" photo, the man wore torn and dirty clothing, was draped in an old, tattered blanket, and wore make-up that made him appear unwashed (see Figure 7). Previous research using these stimuli validated that the photos are viewed as sharply contrasting in status, (Shariff et al., in press.).

Figure 7. In Study 5, American and Indian women were randomly assigned to view and rate the attractiveness of the same male target in either a low-status (left) or high-status (right) context. Previous research using these stimuli validated that these photos are rated as high and low status, respectively, with a large-sized difference in both explicit and implicit status ratings (Shariff et al., in press.).

3.5.3 Results

We conducted a 2 (target status: high vs. low) x 2 (culture: Indian vs. American) ANCOVA (controlling for SOI-R) predicting attractiveness ratings. A significant interaction emerged, $F(1,59)=4.57$, $p=.037$, indicating that Indian women showed a stronger preference for

the high-status target compared to American women.[14] To further understand this cultural difference, we next conducted two one-way ANCOVAs predicting the effect of target status on attractiveness, within each culture. Results demonstrated that Indian women were significantly more attracted to the businessman than the homeless man, $F(1, 23)=9.95$, $p<.01$.[15] In contrast, American women showed no difference in their attractiveness judgments of the two targets, $F(1, 33)=1.69$, $p=.20$ (see figure 8).

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[14] This interaction was reduced to non-significance if SOI-R scores were not statistically controlled, $F(1,61)=0.94$, $p=.34$.

[15] This effect was reduced to non-significance if SOI-R scores were not statically controlled, $F(1,25)=2.82$, $p=.11$.

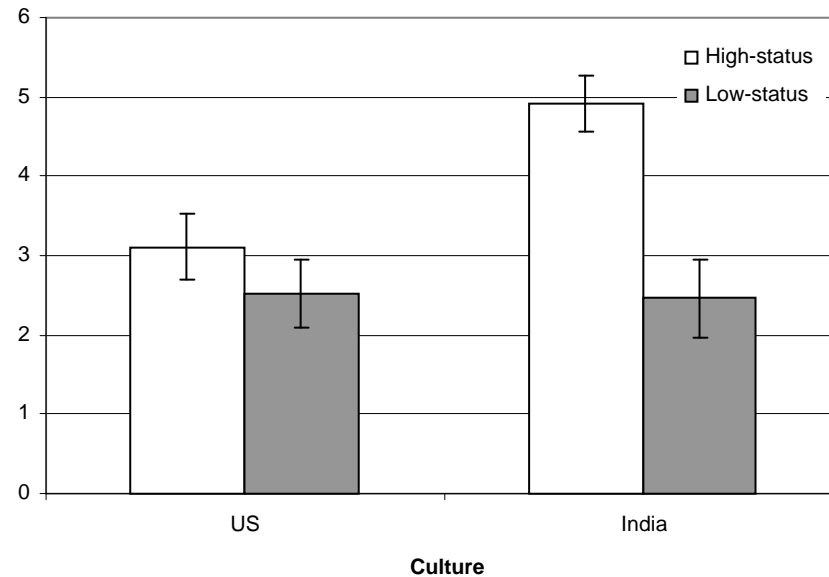**Attractiveness of Men's Status, by Culture**

Figure 8. Estimated marginal mean sexual attractiveness ratings (controlling for SOI-R) of a male target in either a low-status (homeless person) or high-status (business person) context, viewed by Indian and American women. Indian women found the target significantly more attractive when he was portrayed as high-status compared to low status, $p<.01$; for American women, status had no significant effect on the target's attractiveness, $p=.20$. N=62.

Sociosexual Orientation Inventory-Revised (SOI-R) scores were controlled for in our analyses of Study 5, and an alternative interpretation of these data could be that Indian women are simply more sexually restricted, and this leads them to prefer a man who is more likely to be a good long-term mate (presumably the businessman). However, the two cultures did not

differ in SOI-R scores, $F(1,60)=0.87$, $p=.36$, thus, results cannot be explained by a cultural difference in propensity toward a long/short-term mating strategy.

Consistent with our hypothesis that American women place less emphasis on a man's status as an indicator of his attractiveness than do women from cultures where women have less economic freedom, our status manipulation affected Indian women's attractiveness ratings considerably more than American women's ratings. These results are consistent with those of Study 4, showing that American women found men displaying pride (a high-status emotion) as less attractive, and men displaying shame (a low-status emotion), as more attractive, compared to Indian women. In addition, results from Study 5 also provide the first experimental evidence that the importance of status to a man's attractiveness varies across cultures.

3.6 Discussion

The findings of Study 5 help explain why male shame displays can be so attractive to North American women despite conveying low status. If the low-status message of male shame is not seen as problematic by these women, consequently, they are able to focus on shame's more positive as well as more culturally specific mate-relevant cues.

One such cue potentially driving the attractiveness of male shame is that the expression may be becoming more normative and acceptable among men within North American culture. Since the post-Vietnam era, sociologists have noted a shifting trend in the North American media's depiction of masculinity, from "corporate and success-driven", to a more victimized male identity; this trend has also been prominent in popular children's literature (Brayton, 2007; Silverman, 1992). As described by Savran (1996, p. 129), the new prototypical male has moved from seeking to "humiliate and master others," to instead turning "this impulse back upon

himself." Indeed, current popular cinema provides poignant examples of brooding, troubled, yet idealized male heroic figures (e.g., Sylvester Stallone, *Rambo*; Mel Gibson, *Braveheart*; Robert Pattinson, *Twilight*). This brooding masculine image is seemingly consistent with the shame expression; the new idealized man may explicitly feel or express shame, or he may carry himself in such a way as to express it nonverbally through his prototypical behaviors.

Masculine and feminine ideals as propagated by the media tend to have a major impact on social standards of beauty (Frith, Cheng, & Shaw, 2004; 2005), so, from a socio-cultural perspective, part of the appeal of the male shame expression may be attributed to its current normativity and associations with masculinity in North American culture (Brown, Cash, & Noles, 1986; O'Doherty et al., 2003), however future studies are needed to directly test this account. For example, if men paired with personality profiles describing them as troubled, regretful brooders were rated as more attractive among North American women than women in other cultures, it would provide some support for this account.

In addition, there are other possible reasons why male shame displays might be attractive to those who can overlook its low-status message. For example, these displays might be attractive because they lead to perceptions of rebelliousness and social transgression. Although these seem like negative traits, they may also convey a sense of risk-taking, which can increase men's attractiveness (Keltner, Young, & Buswell, 1997). Past work has shown that men tend to engage in more risk-taking behavior when they are motivated toward romantic goals, presumably because they believe that this behavior will make them more attractive to women (Baker & Maner, 2008). Another possibility is that, as an appeasement display, shame elicits a nurturance response from female onlookers, who may become motivated to protect the expresser from potential harm. Past work has shown that both women and men list "a desire

to protect" their partner as a reason for engaging in casual sex (Li & Kenrick, 2006), suggesting

that nurturance could account for the attractiveness of shame in both genders. Future studies

may test this account by examining whether men showing shame are more attractive to women

with a stronger desire to protect or with particularly strong nurturing tendencies. All of these

possible explanations are consistent with the messages sent by the male shame expression and

could potentially undergird its sexual attractiveness independently of the display's low-status

message

Chapter 4. General Discussion

The present research: (a) examined the effects of several distinct emotion expressions on first-impression sexual attraction, and (b) tested competing biological and socio-cultural accounts for the finding that North American women are particularly attracted to men displaying shame. Results from studies 1 and 2 demonstrate that distinct emotion expressions have gender-specific effects on sexual attractiveness, which largely hold across age. Men are made most attractive by displaying pride and least attractive by displaying happiness, whereas women are made most attractive by displaying happiness and least attractive by displaying pride. Both men and women are considered attractive when displaying shame; for men, shame is second in attractiveness only to pride (and in some cases it is equally attractive to pride), and for women shame is second in attractiveness only to happiness.

The finding that shame expressions are judged as relatively attractive, even by female viewers, is somewhat surprising, given that shame is a low status emotion, and women especially tend to seek high-status mates (Li & Kenrick, 2006). To better understand this effect, in Studies 3 and 4 we tested whether the attractiveness of male shame displays can be explained by the hypothesis that shame displays indicate good genes, or by a socio-cultural account: that North American women are particularly attracted to male displays of shame. Results across the two studies consistently supported the socio-cultural account. Study 3 demonstrated that women at highest risk for conception—who tend to be particularly attuned to signals of genetic fitness—are less attracted to men displaying shame compared to women at low conception risk, suggesting that the expression's appeal is not biologically driven, and, in fact, that shame-displaying men have low mate value from a genetic standpoint. Study 4

demonstrated a cultural difference in the attractiveness of male shame displays, with American women showing greater attraction to these displays than Indian women. This cultural difference may be due to several social factors unique to North Americans. Specifically, we hypothesized a cultural difference in the importance placed on a man's ability to attain high status, such that in cultures where women have greater opportunities to acquire resources needed to support themselves and their offspring, they may be more open to a potential mate showing shame (a signal of low-status).

In Study 5 we directly tested the theory that a difference in status concerns contributed to the results of Study 4, and found that a man's status plays a considerably larger role in Indian women's judgments of his attractiveness, compared to American women's judgments. Together, these results support the socio-cultural account of the attractiveness of male shame and provide the first experimental evidence of cultural variation in the attractiveness of high status men.

4.1 Implications

These findings have several implications for our understanding of the impact of emotion expressions on romantic attraction as well as human mate selection. Of the emotions investigated in the present research, the happiness display, typically associated with femininity (Becker, et al., 2007), was found to be one of the least attractive expressions when shown by men, and the most attractive when shown by women. Conversely, the pride expression, which conveys typically masculine qualities such as dominance and status, was one of the most attractive expressions when shown by men and one of the least attractive when shown by women. Gender dimorphic qualities have been shown to enhance attractiveness of men and

women (see Rhodes 2006), and the present findings regarding happy and pride displays are largely consistent with this notion, though more work is needed to test this account for other emotion expressions. If gender dimorphism accounts for the present findings, future studies along these lines may reveal that anger, for example, is more attractive when shown by men than women, given that aggression is typically associated with males, and anger expressions are more reliably recognized in men, suggesting that people intuitively associate these displays with masculinity (Becker et al., 2007). However, the extent to which an emotion expression is gender dimorphic may not entirely explain that display's attractiveness. In fact, as noted in the present research, the shame display is a signal of low-status and submission (Shariff & Tracy. 2009; Gilbert, 2007), so its attractiveness in men is contrary to the expectation that men should appear dominant and confident (Cicone & Ruble, 1978; Rainville & Gallagher, 1990).

The present findings may also contribute to a deeper understanding of the evolution of human emotion displays. In addition to providing physiological benefits to displayers, emotion expressions communicate important, fitness-relevant information to observers, and the present research is the first to demonstrate that this information extends into the mating domain. If emotion expressions provide cues regarding an individual's fitness or reproductive success, it is likely that this communicated information would have been beneficial in ancestral environments, and thus may have contributed to the evolution and persistence of certain emotion displays. If this is the case, based on the sex differences observed in this research, we might expect that the prevalence of emotions would have evolved differentially between men and women, such that certain emotions are shown more or less depending on gender. For example, if women preferred to mate with dominant men throughout evolutionary history because these men were best able to provide necessary resources to offspring through status attainment, then men

might have evolved a propensity to advertise their dominance, more so than women. One route to advertising dominance is through the display of emotion expressions associated with dominant male features, such as a visibly expanded posture and enlarged upper body, both of which are behavioral components of the pride expression. Consistent with this hypothesis, men tend to score higher on affective measures of certain types of trait and state pride experiences than women (Tracy & Robins, 2007). Prior studies have not examined gender differences in the frequency of the pride display, but if the prevalence of emotion expressions is, to some extent, sexually selected, we would expect these displays to be more common in men than women.

Finally, these findings also have implications for our understanding of the role of status signals in attraction. In contrast to past research suggesting that men's status predicts how sexually attractive they are perceived to be across cultures, such that the extent to which a man is high status is positively related to how desirable women find him (Buss, 1989), the present findings suggest that, in certain cultures, women care less about the status of potential mates than has been assumed. Given the extent to which men invest in status symbols and conspicuous displays of wealth in North American society, our finding that a fine suit is in fact no more attractive to women than tattered rags has important real-world implications for men's mating strategies.

4.2 Limitations and future directions

There are several limitations to the conclusions we can draw from the present research. Study 1 was subject to a limitation in that we used the same target (in the same lighting conditions) to portray three different emotion expressions, and a neutral control. Although this method has the benefit of allowing us to conclude that any differences between expressions

must be due to those expressions, and not to differences among different targets, it remains possible that results of that study are unique to the particular two targets used. However, this concern is ameliorated by the replication of Study 1's findings in Study 2, where participants viewed and rated the attractiveness of 30 different opposite-sex targets posing each expression (120 targets total). Likewise, the central limitation of Study 2—that participants viewed all expressions, allowing for judgments to be made on a comparative basis—is ameliorated by the replication of findings in Study 1, where each participant viewed only a single photo, of a single target showing one expression.

More broadly, though the emotion photographs used in the present research were verified as accurately conveying each intended emotion using Emotion-FACS (see Ekman & Rosenberg, 2005) and previously published guidelines regarding shame and pride expressions (e.g., Keltner, 1995; Tracy & Robins, 2007), the evidence for cross-cultural recognition of these displays differs depending on the emotion expressed. In particular, shame recognition rates tend to be lower, across samples, and not always significantly greater than chance (see Haidt & Keltner, 1999). However, several studies have found shame recognition rates to be significantly greater than chance and comparable to rates for other displays, in several different cultural groups (Izard, 1971; Keltner, 1995; Tracy & Robins, 2008), and there is evidence for spontaneous displays of shame by the congenitally blind, suggesting that these displays are likely to be universal and possibly even innate (Tracy & Matsumoto, 2008). Nonetheless, it is possible that participants who viewed and rated photographs in the present research did not explicitly recognize each target as expressing the intended emotion. In our view, this possibility is unlikely to affect the conclusions drawn from the present findings, because if male and female emotion expressions evolved with the added functional benefit of being markers of mate-relevant trait

information, this social information should be automatically perceived, and not be dependent on an observer's conscious appraisal. For example, if pride evolved as a functional high-status signal, a person who expresses pride should automatically be viewed as high status, and as a viable source of social-learning opportunities, and consequently be accorded deference from observers regardless of whether those observers are able to accurately label the expresser's emotion as pride. Likewise, if the attractiveness of an emotion expression is based on inferred trait information about the actor, the expression's attractiveness should be automatically perceived in the same way. Nonetheless, future studies should examine whether the attractiveness of emotion displays vary depending on observers' conscious identification of the emotion.

That said, though we hypothesized that emotion expressions are attractive (or unattractive) because they signal certain mating-relevant traits or characteristics (e.g., pride signals dominance), it is also possible that the attractiveness of an emotion expression is due instead to its facial and physiognomic features (e.g., pride's expanded posture highlights male musculature). In other words, it may not be the trait information communicated that makes the expression attractive, but rather the difference in physical appearance. Consistent with this alternative account are past findings showing that women view men's faces as more masculine, and men view women's faces as less feminine and less attractive, when viewed at an upward tilted angle (Burke & Sulikowski, 2010). One of the behavioral components of pride is a slight head-tilt upward, making it possible that this physiognomic feature contributes to the expression's gender-specific attractiveness, perhaps above and beyond any mating-relevant trait information such that is conveyed through the pride display. However, in Study 5, in both conditions our target was shown with identical physiognomic features and behavioral

components and, at least for some women, was more/less attractive depending on the mating-relevant trait information provided. So, we at least know that women are attentive to other sources of mate-relevant information besides purely physical features when making judgments of attractiveness. Though this study used only a target showing a neutral expression and more studies are needed testing emotions such as pride, shame and happiness to determine whether these expressions are (un)attractive because they convey certain trait information or simply because of their physiognomic or behavioral features.

Another possible limitation of the present research is that in Study 1, all participants were Canadian undergraduates, who are often not representative of the human population at large (Henrich, Heine, & Norenzayan, 2010). Study 2 Sample B partly addressed this concern by including a broader North American participant sample, which ranged in age from 28-83, and Study 4 most directly dealt with this issue (though only with female raters) by replicating several findings from Studies 1 and 2 among a sample of adult Indians. Specifically, the results of that study demonstrated that Indian women, like those in North America, were most attracted to men displaying pride, and that men displaying happiness were more attractive only than men showing a neutral expression. In addition, the finding of a cross-cultural difference in the attractiveness of shame expressions, in that Study, allows us to draw conclusions about the likely cause of shame's attractiveness among North Americans in Studies 1 and 2. Nonetheless, future studies should seek to replicate the present findings in a broader range of populations, especially given the cultural difference noted in Study 4.

For example, one possible explanation for American women's indifference to low-status men is that these women have plenty of access to economic and education opportunities, and so can provide necessary resources for their offspring's survival without relying on the support

of a male partner (see Kasser & Sharma, 1999). Our test of shame's attractiveness among Indian women provides strong support for this explanation, given that India is a country with much lower levels of gender equality (*United Nations Human Development Report,* 2011). However, India and the U.S. differ in many other cultural and demographic features as well, so additional research is needed, ideally examining this mechanism more specifically. To stringently test whether women's attraction to male shame varies by their access to economic opportunities, future studies might examine these differences within the same population. For example, if American women of higher socio-economic status are found to be more attracted to male shame displays compared to American women of lower socio-economic status, this would provide support for the proposed mechanism underlying the cultural difference in attraction to male shame noted in Study 4.

Study 3 was subject to a methodological limitation in the assessment of women's ovulatory cycle using a self-report, rather than a hormonal method. Although the reliability of the ovulation assessment method used in the present research has been disputed (Bean et al., 1979; but see Baker, Denning, Kostin, & Schwartz, 1998), our invocation of a new method to assess women's confidence in their self-reported menses onset attempts to address this issue, and may be useful for future studies in ovulation research. Specifically, we asked women to report how confident they were in their estimate of the date of the first day of their last period of menses, and women who could not be included in one category or the other with 100% confidence were excluded from analyses. While it is likely that women do make errors in their self-reported menses dates, they are also likely to have a good sense of their own level of accuracy on this topic, and our method takes advantage of that self-insight in a way that no prior studies have. This confidence assessment method allows for women's uncertainty on this

issue to be taken into account, and thus may ameliorate some concerns regarding the use of self-reported estimates of menstrual cycle.

More generally, it is important to note that results of the present research are specific to first impression, sexual attraction, and thus may not apply to the ways in which individuals evaluate potential long-term dating partners. Both men and women differ in the traits they value in a sexual versus long-term partner (Li & Kenrick, 2006), therefore future research is needed to examine whether these effects hold in more stable potential romantic contexts. For example, when evaluating short- rather than long-term mates, women tend to place comparatively less emphasis on kindness and comparatively more emphasis on social status in potential partners (Li & Kenrick, 2006). Thus, assuming happiness is associated with kindness, we might expect a woman's attraction to a man displaying happiness to be greater if she were evaluating him as a potential marriage partner.

Finally, an important question for future research is whether these effects generalize beyond judgments of a decontextualized photograph. That is, would these emotion expressions have the same impact on sexual attractiveness in live social interactions? Studies have shown that attractiveness ratings of targets from static photographs tend to be fairly predictive of targets' attractiveness in face-to-face encounters (Roberts et al., 2009; Rhodes et al., 2011); however, this may not be the case when targets show various emotion expressions, given that expressions may be perceived differently when shown in a real interaction versus in a photo. Regardless of this issue, though, given the importance of first impressions and the frequency with which potential partners meet via a single photo (e.g., on social networking/dating websites), the present findings provide new insights to our understanding of why certain people successfully attract others, why others do not, and how individuals seeking a mate should

advertise their status and regulate their emotions. For example, smiles tend to be socially

appropriate across many situations, but there are contexts in which the appearance of sexual

attractiveness is valued over social correctness. The present results suggest that men may need

to choose between these competing social goals, but women do not.

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