Populational differences in attractiveness judgements of male and female faces: Comparing British and Jamaican samples

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Abstract

In the UK and Japan, both men and women prefer somewhat feminised opposite-sex faces, especially when choosing a long-term partner. Such faces are perceived as more honest, caring, and sensitive; traits that may be associated with successful male parental investment. By contrast, women prefer less feminised faces for short-term relationships and when they are near ovulation. As genetic quality may be associated with facial masculinity, women may 'trade-off' cues between genetic quality and paternal investment in potential partners. No analogous trade-off has been suggested to influence men's preferences, as both attributions of prosociality and potential cues to biological quality are associated with facial femininity in female faces. Ecological and cultural factors may influence the balance of trade-offs leading to populational differences in preferences. We predicted that Jamaican women would prefer more masculine faces than British women do because parasite load is higher in Jamaica, medical care less common (historically and currently), and male parental investment less pronounced. Male preferences, however, were predicted to vary less cross-culturally, as no trade-off has been identified in female facial characteristics. We constructed masculinised and feminised digital male and female face stimuli of three populations (Jamaican, Japanese, and British) and presented them to men and women in Jamaica and in Britain. The results demonstrated that Jamaican women preferred more masculine male faces than their British counterparts did. Jamaican

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men tended to prefer more masculine female faces than did British men did, but this effect was complicated by an interaction suggesting that more feminised faces were preferred within culture.
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1. Introduction

Cross-cultural studies indicate high consensus in facial attractiveness judgements across different populations (e.g., Cunningham, Roberts, Barbee, & Druen, 1995; Jones & Hill, 1993; Perrett, Lee, et al., 1998). This cross-cultural agreement, coupled with the relatively straightforward testing of preferences relevant to sexual selection models, has led facial attractiveness research to be considered one area of cognitive science where evolutionary perspectives have been successfully integrated into psychology (Thornhill & Gangestad, 1999a). As consideration of the complexity of human mate choice has increased, however, it has become clear that some hypotheses derived from evolutionary biology predict variability in attractiveness judgements across different ecological and cultural situations. Below, we briefly review approaches to both female and male facial attractiveness, before expanding on the reasons to expect attractiveness judgements of male faces but (tentatively) not female faces to vary cross-culturally.

1.1. Female facial attractiveness

Published studies of female attractiveness show that men demonstrate a high level of consistency in preferences across individuals, cultures, and experimental techniques (Fink & Penton-Voak, 2002; Thornill & Gangestad, 1999a, 1999b). Overall, sex typical female facial characteristics (small jaws, full lips, etc.) appear to be preferred universally. Because facial femininity (in shape and complexion) decreases with age and is associated with youth by observers, such cues may signal reproductive potential (Perrett, Lee, et al., 1998). Facial femininity is also hypothesised to signal endocrine health and, hence, fertility (Thornill & Gangestad, 1999a, 1999b). A less feminine body shape (a high waist-to-hip ratio) is linked to reduced pregnancy rates in women undergoing in vitro fertilization (Wass, Waldenstrom, Rossner, & Hellberg, 1997; Zaadstra et al., 1993). Masculine face shapes in females may similarly provide a visible cue to impaired fertility, although there has been no direct test of this hypothesis to date. Feminine female faces are also associated with positive personality characteristics, which may also influence attractiveness (Perrett, Lee et al., 1998).

1.2. Male facial attractiveness

Despite the success of research into female attractiveness, it has become clear that the simple application of 'good genes' sexual selection models fails to provide a full account of

female preferences for male faces. Good genes theories have become more popular with the empirical demonstrations of the heritability of fitness (e.g., Petrie, 1994), and models suggesting that indicator mechanisms may evolve under conditions characterized by rapidly changing selection pressures (e.g., host–parasite coevolution; Andersson, 1994; Hamilton & Zuk, 1982; Kirkpatrick, 1996). Such models predict preferences for exaggerated secondary sexual characteristics in male faces (masculine traits such as prominent brow ridges and large jaws), as such traits may be honest handicaps, that is, reliable signals of male quality due to the suppressive action of testosterone on active immune function (Folstad & Karter, 1992; Hillgarth & Wingfield, 1997).

The role of facial masculinity in attractiveness judgements, however, is disputed (Fink & Penton-Voak, 2002; Thornhill & Gangestad, 1999a). Masculine features, such as a large jaw and a prominent brow ridge, are reliably associated with ratings of dominance in photographic, "identikit," and composite stimuli by male and female raters (Berry & Brownlow, 1989; Berry & Wero, 1993; McArthur & Apatow, 1983–1984; McArthur & Berry, 1987; Perrett, Lee, et al., 1998). Perceived facial dominance correlates with status in some human hierarchies (Mueller & Mazur, 1997), and in adolescent males, it is associated with earlier age at first copulation (Mazur, Halpern, & Udry, 1994). Nonetheless, the relationship between facial dominance and attractiveness is unclear—some studies find a positive relationship (e.g., Keating, 1985) while others find the opposite (Berry & McArthur, 1985; McArthur & Apatow, 1983–1984; Perrett, Lee, et al., 1998). Cunningham, Barbee, and Pike (1990), Grammer and Thornhill (1994), and Scheib, Gangestad, and Thornhill (1999) used facial measurements and found a female preference for large jaws in males. Using similar methodologies, however, Penton-Voak et al. (2001) failed to replicate this finding. Other studies suggest that a mixture of masculine and feminine traits is found attractive (Cunningham et al., 1990). The variations in results between different studies of male facial attractiveness are curious, given that equally diverse methodologies have found remarkable consensus in the characteristics of attractive female faces.

1.3. Strategic pluralism and facial attractiveness

Inconsistencies in the findings of male facial attractiveness studies may result from facial masculinity offering both benefits and costs to a potential partner. Although facial masculinity may offer advantages in terms of good genes indicators and social dominance, the owners of less masculine faces are perceived as possessing more prosocial personality characteristics, such as warmth (Perrett, Lee, et al., 1998). This contrasts with female faces, in which putative cues to fertility and prosocial personality are both associated with femininity. Personality factors are important in mate choice cross culturally (Buss, 1989), and social perception of personality characteristics in faces has been shown to influence a wide variety of everyday social interactions (see Zebrowitz, 1998, for review). It seems likely, then, that somewhat feminised male faces may benefit from attributions of positive personality traits and thus be rated as attractive despite their lack of stereotypical masculine features. Personality traits attributed to faces by strangers appear to have some accuracy, and there may be relationships (albeit complex) between testosterone, facial appearance and antisocial behaviour (see

Penton-Voak & Perrett, 2001, for a tentative exploration of this link). Women's accurate judgement of personality may lead to increased reproductive success if paternal investment differs between men with different personality traits.

In an effort to resolve the discrepancies in the male facial attractiveness literature, researchers have begun to consider the possibility that strategic pluralism may account for the variability in female preferences for male faces. Conditional mating strategies in women may involve evaluating the information afforded by male faces (cues to good genes in the form of masculinity, or cues to paternal investment and prosociality indicated by facial femininity) with regard to life history factors and the context of the relationship sought. One example of a conditional female preference for male faces is the demonstration of shifting preferences for masculine traits across the menstrual cycle (Frost, 1994; Penton-Voak & Perrett, 2000; Johnston, Hagel, Franklin, Fink, & Grammer, 2001). These changes in preferences for male faces occur in interaction with the specific context of the attractiveness judgement (short- or long-term relationship) and life history factors (presence or absence of a partner; Penton-Voak et al., 1999). Women prefer relatively masculine faces in the follicular phase of their menstrual cycle, especially when they have a long-term partner and are judging attractiveness for a short-term relationship. This finding has implications for the role of extra-pair copulations in the evolution of human sexuality, as it is consistent with women picking a feminine face in a long-term partner (indicating possible future investment in offspring), while choosing relatively masculine men to father offspring (to gain heritable immunocompetence benefits (Little, Jones, Penton-Voak, Burt, & Perrett, 2002). Cyclic shifts have also been reported in women's preferences for male odours (Thornhill & Gangestad, 1999b). Another example of potential strategic pluralism in humans was reported by both Little, Burt, Penton-Voak, & Perrett (2001) and Penton-Voak et al. (2003), who demonstrated that female self-rated attractiveness also influences preferences. Women who judge themselves as more attractive than average prefer more masculine and symmetric male faces than do women who rate themselves as less attractive—a finding analogous to condition-dependent mate choice in other species (e.g., Bakker, Kunzler, & Mazzi, 1999).

While men are also predicted to employ different mating strategies (particularly with respect to the resources devoted to mating vs. parenting effort; Gangestad & Simpson, 2000), the trade off model of strategic pluralism cannot be applied to judgements of female facial attractiveness. In male faces cues to putative biological quality (masculinity) come at the cost of undesirable personality attributions. In female faces, however, femininity is an indicator of youth, a possible cue to fertility, and is also associated with positive personality attributions (Perrett, Lee, et al., 1998). The absence of a trade-off in these characteristics suggests that male judgements of female attractiveness may exhibit less contextual variation than female preferences for male faces. The consistency of the female facial attractiveness literature (in contrast to the complex findings regarding male facial attractiveness) seems to support this interpretation.

1.4. Cross-cultural attractiveness judgements

Female judgements of male attractiveness are consistent with a trade-off between cues to good genes and cues to expected paternal investment. There is evidence that preferences may

change facultatively in response to personal circumstances, but wider scale environmental, cultural, and ethnic factors may also influence the balance of the trade-off. As no analogous trade-offs in men's attractiveness judgements of female faces have been identified, the most parsimonious prediction is that male preferences should exhibit less cross-cultural variation if female facial attractiveness is an honest indicator of reproductive potential. Below, then, we consider some factors that may influence women's preferences for sexually dimorphic characteristics in male faces and why they may differ between the two populations we studied in the current work: Jamaican and British.

We suggest that three interconnected factors should lead to a greater preference for masculine male faces in Jamaican women than in British women. These are differences between the two populations in parasite load, history of medical care, and degree of male parental investment, especially in a woman's first child. In rural Jamaica, parasite loads are higher than in Britain, medical care is relatively infrequent, and males often invest little in the early-born children of women. These factors will all favour greater female choice for masculine facial features.

Gangestad and Buss (1993) showed that across a large sample of societies, pathogen load is positively related to an individual's stated importance of physical attractiveness in mate choice. Although the traits themselves are not specified in this paper, preferences for facial masculinity should increase facultatively with pathogen load as cues to immunocompetence become more important. Likewise, individuals in societies with a long history of medical care should show less bias toward masculine male faces than individuals in societies that have had little medical care for most of the population, since cues to health are relatively less valuable and may be outweighed by other criteria in mate choice (e.g., paternal investment). Preferences influenced by recent medical care could influence either facultative responses or have led to the recent development of genetic differences between populations. Finally, low male parental investment in a female's early offspring means that for young females, mate choice for good genes is likely to be a more important component of mate choice than potential paternal investment is because such investment is unlikely.

Differences in the pattern of paternal investment between the UK and Jamaica arise from a complex set of historical circumstances. In comparison with British women, Jamaican women are often household heads, a fact that Massiah (1982) attributes to three main causes: (1) a cultural heritage of nonnuclear family patterns (possibly with historical roots in preemancipation populations), (2) economic factors, leading to an inability of males to secure jobs that would permit easy family maintenance, and (3) sociological factors not strongly favouring marriage or cohabitation over nonresidential or "visiting" sexual relationships. Each of these potential causes is outlined below.

There is a substantial literature offering explanations for the contemporary family form among African-derived peoples of the Americas (for review, see Barrow, 1996). Most children in Jamaica are born to unmarried women. In 1946, the figure was 60–75% (Simey, 1946), and this value remained unchanged 40 years later (Smith, 1988, p. 22). This pattern may, in part, have been established during slavery, in which the family unit was often reduced to a mother and dependent children (Barrow, 1996; Smith, 1988), which itself may have set the stage for the social acceptability of reduced paternal investment.

The economic roles of men in the UK and Jamaica differ widely. As early as 1946, it was recognized that "the insecurity of his position in the family and his poverty make it difficult for [a Jamaican man] to discharge obligations of parenthood which are accepted without question in Great Britain and North America" (Simey, 1946, pp. 15–16). "The occupational system in the West Indies has made it difficult for men to be reliable providers, and has made it possible for women to sometimes earn as much as men—more in some cases" (Smith, 1988, p. 146). Historically and currently, women worked alongside men in some of the hardest manual labour positions, such as heavy agriculture, road work, and animal husbandry. Women engage in such tasks as loading bananas, breaking rock for road construction, farming small plots, and cutting and carrying firewood (Smith, 1988). Lower and middle class Jamaican women often find work as domestics and also make up the majority of petty trade labourers, including those selling vegetables at market, selling baked goods, sewing dresses, and doing other income producing activities (Smith, 1988).

Patterns of marriage and reproduction vary greatly between Britain and Jamaica. UK women marry earlier than their Jamaican counterparts do, and many Jamaican women remain unmarried throughout their lives. In 1991, 57% of 40- to 44-year-old Jamaican women were unmarried (Jamaican Institute of Statistics)—in the comparable British cohort, less than 10% of women were unmarried (UK National Statistics for Social Trends, 2001). Jamaican women begin their reproductive lives relatively early in comparison with women in the UK: 11% of Jamaican women aged 15–19 have a child each year, while in the UK, the comparable figure is 3% (statistics from International Planned Parenthood Foundation, 2001, http://ippfnet.ippf.org/). A strong cultural emphasis on childbearing as a symbol of adulthood in Jamaica leads many young women into bearing a large economic burden without male support (see Senior, 1991, for a wide ranging review on the roles of women and family structures in the Jamaican and Caribbean society).

Paternal investment cannot be easily quantified in humans due to the great diversity of behaviours that may benefit a man's offspring. From the perspective of evolutionary biology, it seems reasonable to propose that paternal investment, on average, is higher in the UK than in Jamaica. This supposition is supported by demographic statistics and sociological examinations of family life in the Caribbean (see above, and Senior, 1991). Given the low expectation of paternal investment that such factors engender, it is hypothesized that Jamaican women may respond in a facultative manner by favouring potential cues to good genes (facial masculinity) in partners rather than favouring cues to paternal investment (facial femininity; Perrett, Lee, et al., 1998). This hypothesis was tested in Study 1 by comparing Jamaican and UK samples of women judging masculinised and feminised versions of British, Jamaican, and Japanese stimuli for attractiveness.

While there are several hypotheses that predict differences in female preferences across environments and cultures, few of these can be used to predict cross-cultural variation in male preferences for female faces. Most published studies of facial attractiveness would predict that men should universally be attracted to cues to youth and fertility and positive personality characteristics—all of which are hypothesised to be indicated by facial femininity. To test this theory, men in the UK and Jamaica judged the attractiveness of

masculinised and feminised versions of female British, Jamaican, and Japanese stimuli in Study 2.

2. Methods

2.1. Preparation of stimuli

Japanese faces (students at Otemon-Gakuin University, 28 males, age 20–23, mean 21.6 years; 28 females, age 20–22, mean 21.4 years; of Japanese descent) were photographed under standard lighting conditions with neutral facial expression. Similar photographs were prepared for British (students at St. Andrews University, 25 males, mean 21.0 years; 30 females, mean 20.6 years; all of Northern European descent) and Jamaican faces (residents of Southfield Parish, 20 males, mean age 23 years; 20 females, mean age 22.6 years; all of African descent). Japanese and British photographs were converted to digital format (Kodak Photo-CD). The Jamaican sample was photographed using a digital camera under standard conditions at 1050×1411 pixel resolution. One hundred and seventy-four feature points on salient facial landmarks (e.g., nose tip) were defined manually for each face. The Japanese and British photograph sets were the same as those used to create the composites in Perrett et al., 1998, although new stimuli were created for this experiment.

Six average faces were generated from males and females of the three populations. To create each of these sex 'average' faces, the mean XY position of each delineated feature point was calculated to generate the shape information within each group (e.g., Jamaican female, British male). 'Average' color was generated by rendering color information from each individual from the group into this average shape and calculating mean RGB color values across the face set for each pixel location. To avoid possible confounding effects of facial hair on color information, males with beards were not photographed for use in the construction of the male averages.

To generate male faces with exaggerated or reduced levels of shape dimorphism, male and female averages were aligned on a point midway along a horizontal line between the eyes of both prototypes. To construct feminised male face shapes, every feature point on the male face can be moved a prescribed distance along a vector toward its correspondent point on the aligned female average. Two feminised male face shapes were generated (representing 20% and 40% of the vector differences between male and female face shapes) from the average male faces of each population represented (Jamaican, Japanese, and British). Two masculinised face shapes were constructed for each population by exaggerating the vector differences between points on the male and female averages by 20% and 40% (see Fig. 1). Identical color information from the appropriate average face was then warped into the feminised and masculinised faces (see Rowland & Perrett, 1995, for details of computer techniques employed.) The same technique was used to generate five masculinised and feminised versions of each female average in the Jamaican, Japanese, and British sets for use in Study 2.

Fig. 1. Forty percent masculinised (left) and 40% feminised (right) versions of Male Jamaican, Japanese, and British stimuli.

The five male images in each set (Jamaican, Japanese, and British) were then printed out in full color at photographic quality and laminated for use in Study 1. The equivalent female images were printed in the same way for use in Study 2.

3. Study 1: Female judgements of male attractiveness

3.1. Participants

The images were judged in Jamaica by 48 Jamaican women, with mean age 24.9 years, from St. Elizabeth and Westmoreland Parishes (Jamaica is divided into 14 geographical parishes or districts). Twenty-six British women from Stirling University (mean age 20.9) judged the same stimuli in the UK.

3.2. Procedure

The five stimuli in each set were presented to the participants, who were free to handle the printed images to allow close comparison between the five faces. The participants were asked to choose the face that they thought was the most attractive of the five. The level of masculinity/femininity of the face was recorded by the experimenter, and the next set of five faces was presented until all three sets had been judged by the participant. The order of presentation of the three sets of images was counterbalanced. The procedure employed was identical in Jamaica and Scotland.

3.3. Results

Women's preferences for the male faces are illustrated in Fig. 2, top panel. These data were analysed with a repeated-measures ANOVA, with population of face as the repeated measure (Japanese, British, and Jamaican) and population of participants as the between-subjects factor (British and Jamaican). Analysis reveals a main effect of participant population [$F(1,71)=18.0$, $P<.001$], with Jamaican women preferring more masculine male faces overall than British women do, but no main effect of population of face [$F(2,142)=2.5$, $P>.05$] and no interaction between population of face and population of participant [$F(2,142)=2.9$, $P>.05$].

Stimuli constructed from the same British and Japanese photograph sets have been presented to British participants before, using an interactive computer technique rather than printed stimuli (Perrett et al., 1998). Mean preferences for femininity in the current study were 18% for British and 3% for Japanese stimuli, compared with 15% for British and 8% for Japanese stimuli in the earlier work (Perrett et al., 1998).

4. Study 2: Male judgements of female attractiveness

4.1. Participants

The images were judged in Jamaica by 26 men, with mean age 24.1 years, from Westmoreland Parish. Twenty-six British men from Stirling University (mean age 21.8) judged the same stimuli in the UK.

4.2. Procedure

Identical to Study 1, but female faces were used, not male.

4.3. Results

Men's preferences for the female faces are illustrated in Fig. 2, bottom panel. These data were analysed with a repeated-measures ANOVA with population of face as the repeated
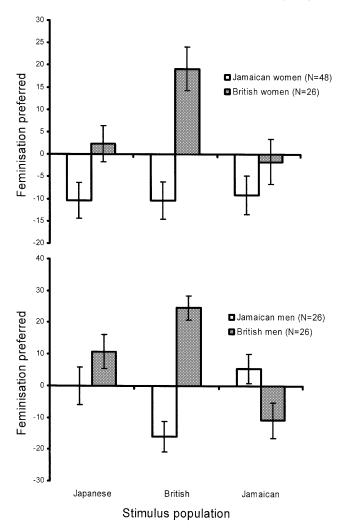
Fig. 2. Mean % transform preference (±1 S.E.) for femininity shown by Jamaican and British women (top) and men (bottom) to each of the three opposite-sex stimuli sets (a preference for negative femininity is a preference for masculinity).

measure (Japanese, British, and Jamaican) and population of participants as the between-subjects factor (British and Jamaican). Analysis reveals a main effect of population of participants [$F(1,50) = 10.0$, $P = .003$], with Jamaican men preferring more masculine female faces overall than British men do, but no main effect of population of face [$F(2,100) = 1.4$, $P > .05$]. There is a significant interaction between population of face and population of participant [$F(2,100) = 14.4$, $P < .001$], with the general trend for Jamaican men to prefer more masculine female faces than their British counterparts do being reversed when Jamaican faces are judged.

As with Study 1, stimuli constructed from the same British and Japanese female photograph sets have been presented to British participants before, using an interactive computer technique rather than printed stimuli (Perrett, Lee et al., 1998). Mean preferences for femininity in the current study were 25% for British and 11% for Japanese stimuli, compared with 24% for British and 10% for Japanese stimuli in the earlier work (Perrett, Lee et al., 1998).

5. Discussion

Despite earlier findings of cross-cultural consistency in attractiveness judgements, our results indicate that subtle differences in preferences exist between cultures. Specifically, we have found a tendency for Jamaican women to prefer more masculinised male faces than do British women. This effect is driven largely by differing preferences for UK faces, but the lack of a significant interaction term in the analysis suggests that the effect is present, to some extent, across conditions. The apparent tendency of this effect to be larger in British rather than Japanese or Jamaican stimuli should be noted as a potential weakness in the robustness of our findings. Earlier studies have used stimuli constructed from the same British and Japanese photograph sets as used in the work reported here (Perrett, Lee, et al., 1998). The results from British participants in the current study replicate the findings of this earlier work: Preferences for femininity in both male and female faces are not substantially different across the studies. The results from Perrett, Lee et al. (1998) also indicate that Japanese women prefer feminised Japanese and British stimuli in comparison with Jamaican women. British men also seem to prefer more feminisation in female faces than Jamaican men do, but this finding is complicated by an interaction suggesting that men prefer more feminised faces in their own population than in others.

5.1. Female preferences for male faces

The differences reported above indicate a general tendency for Jamaican women to prefer more masculinised male faces than British women do. These differences in women's preferences observed in the present study can be interpreted in a number of ways, including, but not necessarily limited to, the following: (1) as culturally determined preferences that differ between the populations studied, (2) as perceptual biases that arise from different life experiences in Jamaica and the UK (and Japan) but have no adaptive significance, and (3) as adaptive responses to environmental or cultural contingencies. Below, each of these possibilities is briefly considered.

Dominance characteristics in males may be valued more in Jamaican society than in the UK or Japan for cultural reasons. Hence, the preference for masculinity found in Jamaica could be driven by stereotypical personality attributions made to faces that have exaggerated male typical features. Similarly, the preferences for relative femininity found in the UK and Japan may reflect cultural norms favouring prosociality in male partners.

Such a preference may not reflect evolved preferences for particular characteristics in opposite-sex faces, but more general-purpose mechanisms of categorisation and stereotyping (e.g., Fiske & Taylor, 1991).

Secondly, differing preferences between cultures may reflect emergent characteristics of the human perceptual system in different social environments. Newborn infants appear to be predisposed to attend to face-like configurations, but human face perception is also clearly influenced by experience (Bushnell, Sai, & Mullin, 1989; Morton & Johnson, 1991; Rubenstein, Kalakanis, & Langlois, 1999; Slater et al., 1998). Exposure to faces has diverse effects on face perception. Such processes may lead to the brain mechanisms that process faces becoming 'tuned' to the characteristics of faces present during upbringing, thereby influencing later attractiveness judgements (Perrett, Oram, & Wachsmuth, 1998; Perrett et al., 2002). To the extent that exposure to faces of different sexes or ages differs between cultures, later preferences can be expected to differ. Given the importance of the face in social interaction, learning of facial characteristics is clearly adaptive. Population differences in preferences, however, may simply be by-products that emerge from this learning process.

The third option is that different preferences between populations may reflect conditional strategies, generating facultative adaptive responses to varying environmental conditions. Differences in environmental conditions could be ecological (e.g., pathogen prevalence) or cultural (societal tendencies towards low or high paternal investment). The findings of the current study are consistent with both these possibilities, but with data from such a limited number of populations available, discriminating between these possible explanations is problematic. Both are worth considering for future research. In the first case, a higher pathogen prevalence in the Caribbean than in Europe or Japan may lead to a stronger preferences for cues, indicating immunocompetence in this environment. The findings of this study are consistent with this hypothesis, as medical atlas data indicate that the Caribbean has a higher pathogen load than the UK (S. Gangestad, personal communication; Gangestad & Buss, 1993). In the second case, the relatively low rates of paternal investment in Jamaica in comparison with both the UK and Japan may lead to the cues of positive personality characteristics becoming less valuable and, hence, less important in mate choice. The results of this study are also consistent with this possibility. Of course, these two adaptationist explanations are not mutually exclusive. Cultures will evolve differently in different ecological environments, and preferences for cues to good genes or paternal investment may become selected for at a cultural level following increases in reproductive success that they offer in varying environments, current or historical. In addition, differences in parasite load and/or male parental investment have existed for ample time to generate some genetic differences between populations.

Choosing between cultural, by-product, and adaptive hypotheses is problematic with the current data set, yet, future experiments with different populations could be designed to disambiguate these theories. It is, however, worth noting that other studies of masculinity and femininity in faces have found variable preferences (Penton-Voak et al., 2003, Penton-Voak & Perrett, 2001), and these shifts are not easily explained either by stereotyping or by-products of perceptual learning strategies.

5.2. Male preferences for female faces

Our results also demonstrate differences in men's preferences for women's faces between the two tested populations. These results, however, are somewhat difficult to interpret. Some aspects of the data are similar to the female preferences: Statistically, Jamaican males prefer more masculine female faces overall than their British counterparts do, which is contrary to the hypothesis that no differences will exist in male preferences cross culturally. As with the female data, this difference may reflect several possible mechanisms, including purely cultural effects, an adaptation, or the by-product of another adaptation—perhaps correlated with adaptive female changes in preferences.

One aspect of the data from female faces, however, is quite different to the data for male faces. The significant interaction term indicates that there is tendency for participants to prefer more feminisation in female faces from their own population than in faces from other populations. This pattern has been reported before: In a study of Japanese and British participants assessing the level of feminisation preferred in Japanese and British faces, more feminisation was preferred in female faces of the same culture as the rater (Perrett, Lee, et al., 1998). As in the current study, this interaction was only significant when judging female, not male, faces. Given that the British men preferred more feminised British faces than the Jamaican men did, and there was a strong trend for Jamaican men to prefer more feminised Jamaican faces than the British men do, it is hard to conclude that a general cultural difference in male preference for female faces has been identified. Within-population judgements in the current study provide weak evidence that male preferences are more consistent than female preferences are cross culturally. Why male judgements of attractiveness based on dimorphism are more variable in pattern across stimuli population than the equivalent female judgements is unknown. In some ungulate and bird species, early experience influences later sexual behaviour to a greater degree in male rather than in female offspring (e.g., Kendrick, Hinton, Atkins, Haupt, & Skinner, 1998; Vos, 1995). A similar process operating in humans may account for the differences in cross-cultural consistency in the male and female raters in this study. Early experience influences later facial attractiveness judgements in humans, and the nature of this influence differs for male and female children (Perrett et al., 2002). A possible sex-difference in the impact of early experience on later preferences may make men less able to generalise preferences (i.e., for femininity) to less familiar face types (i.e., other race faces) than women. This speculation may explain the interaction term in the male participants analysis in this and earlier experiments.

6. Conclusions

This study suggests that more extensive cross-cultural testing from more populations may allow the roles of various factors in human facial attractiveness judgements to be defined. Such an approach has been successful in finding that pathogen prevalence is

correlated with both the incidence of polygyny and the apparent importance of physical attractiveness in mate choice (Gangestad & Buss, 1993; Low, 1990). Our preliminary cross-cultural study seems particularly informative with respect to female choice. Clearly, a strong preference for femininity in male faces in a culture with either a high pathogen load or very low paternal investment would be problematic for the trade off theories of facial attractiveness proposed here. Cross-cultural facial attractiveness studies using carefully varied stimulus parameters may be a useful way of examining the possibility that conditional mating strategies exist in human behaviour, and, if so, what cultural or ecological conditions precipitate changes in preferences. For female faces/male preferences, the situation is complicated—It is not clear from the current results whether general differences exist in the data (i.e., preferences for femininity or masculinity differ across cultures) or whether sensitivity to sexual dimorphic cues is greater within culture, leading to reliable cross-population preferences for relative femininity within populations but not elsewhere.

Acknowledgments

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