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Attractiveness, Is It In The Eye Of The Beholder?

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### Abstract

The sexual attraction theory predicts heterosexual men and women rate traditionally gender-typed individuals as more attractive. Infants have also demonstrated cognitive prototypes of attractiveness rapidly following birth. Average faces may be preferred, indicating heterozygosity, as well as symmetry that is a quality preferred during mate selection. In contrast some studies have shown feminine faces are considered attractive in both females and males. Physically attractive stereotyping is expected from the effects of race, which will increase when featural information is unavailable from low-pass filtered faces. Physical attractive stereotyping is weaker among collectivist societies. There is experimental proof that perfectly symmetrical face shapes are considered attractive.

Darwinian approaches to the study of facial attractiveness are based on the premise that attractive faces are a biological “attribute” that signal valuable information to a potential mate. The perception of facial attractiveness is assumed to be data-driven; the properties of a particular set of facial features are the same, irrespective of the perceiver. From this Darwinian perspective, attractive faces are perceived as such independently of any of the characteristics of the potential mate, such as culture or upbringing. Systematic studies of the differences in facial attractiveness judgements amongst individuals, or of an individual's changing judgements of facial attractiveness over time, are rare. Although individual differences in attractiveness judgements exist, such behavioral variation is rarely given a biological interpretation (Penton-Voak & Perrett, 2000).

Evolutionary biologists studying the sexual behavior of other species provide a framework suggesting that individual differences in human attractiveness judgements may have parallels with the behavioral variation shown by other species (Penton-Voak & Perrett, 2000). While most individuals appear to share basic criteria of facial attractiveness, humans may learn the “fine grain” of the faces they find attractive in an analogous way to the learning or imprinting experiences of some other animals early in their lifetime. Individuals may adopt different reproductive strategies as a result of life history factors these differing strategies may lead to adaptive preferences for different facial feature types (Blumenshine & Cavallo, 1992).

While both males and females report that physical attractiveness is not of primary importance when choosing a partner (Buss, 1989), the single best predictor of satisfaction with a “blind date” is facial attractiveness for both men and women (Walster, Aronson,

Abraham & Rottman, 1966). Given the apparent importance of the face in mate selection decisions, and the centrality of mate choice theories to evolutionary explanations of behavior, sexual selection may have acted on human facial characteristics. Many researchers have searched for evidence that the characteristics of attractive faces are as much biological, as cultural. The first goal of researchers proposing a biological stand is to find certain faces attractive to demonstrate that the learning of arbitrary cultural values has little influence on judgements of attractiveness that attractive faces are considered so universally. Researchers have demonstrated high cross-cultural agreement in ratings of attractiveness of faces of many ethnicities, in many geographic locations (Cunningham, Roberts, Barbee & Druen, 1995, Perrett, May & Yoshikawa, 1994). Darwin acknowledged the possibility of the universality of facial attractiveness across cultures when he noted that explorers had remarked that indigenous peoples around the world had similar standards of beauty (Penton-Voak & Perrett, 2000).

Published paleontological information about the anatomical evolution of humans was used to create line drawings of the human form. Seven hundred and fifty nine participants evaluated more than 40 anatomical traits. Each anatomical trait was presented as a panel of three line drawings intended to express the trait in a primitive, intermediate, and derived form. For each panel, subjects selected the drawings they considered most attractive and least attractive. Males and females of diverse ages, races, cultures, and from varied geographical regions showed commonality in their judgments of beauty of the human form. Participants appeared to have a strong aversion to primitive traits, preferring proportions and characteristics that are intermediate or more derived. In many instances the evaluators preferred drawings that

were exaggeratedly derived. There was high agreement in judging the attractiveness of shape and proportions in line drawings that were not immediately recognized to be representations of human form. This data could indicate that general aesthetic sense for art, architecture, and fashion may be based on a subliminal reference to derived anatomical shapes and proportions. Derived traits that are universally shared by anatomically modern humans may be the standard for an innate sense of beauty of the human form (Magro, 1997).

A second line of evidence in favor of a biological rather than an arbitrary cultural basis of physical attractiveness judgements comes from studies of infant preferences for face types. Langlois, (1987) showed pairs of female faces to infants between 2-3 months and 6-8 months old. The attractiveness of the faces had been pre-judged by adults prior to being presented to the infants. Infants preferred to look at the more attractive face of the pair, indicating that even at two months of age, adult-like preferences are demonstrated. A further study replicated and extended the finding to show that infants also expressed adult-like preferences for Caucasian male faces, Black female faces, and even the faces of other infants (Langlois, Ritter, Roggman & Vaughn, 1991).

Infants have been demonstrated to form cognitive prototypes extremely rapidly. Exposure to specific faces in early infancy may allow infants to learn facial configurations. Although infants demonstrate adult-like preferences very soon after birth (Slater, Von der Schulenberg, Brown, Badenoch, Butterworth, Parsons & Samuels, 1998) this doesn't necessarily imply that children are born with "innate" knowledge of attractiveness. The learning process occurs rapidly, without any obvious linguistic

component and at a very young age. Such learning could be considered to be effectively "culture free" and therefore possibly more analogous to an imprinting process than the learning of cultural norms. Children have been shown to prefer faces rated as highly attractive by adults over faces rated as quite unattractive. Investigators seen to what extent this agreement holds not only for the general direction of preferences but for preference strengths as well (Slater, et al., 1998). In one experiment, the authors presented forty, 9-yr-old girls and their mothers and forty, 12-yr-old girls and their mothers with pairs of women and girls' faces and asked the subjects to pick the face that appeared prettier to them. Preference frequencies and simple attractiveness scales derived from these preference frequencies were compared across subject groups. For the women's faces, the authors found no difference in preferences between 9-yr-olds, 12-yr-olds, and adults, neither in direction or in strength. For the girls' faces, the authors also found no major differences in preference direction; however, they did find reliable differences in preference strengths. To a considerable extent these differences were nicely due to the fact that the children showed less pronounced preferences between face stimuli than adults showed. These results suggest a role of developmental factors in the perception of facial attractiveness (Langlois et al., 1991).

The rapid learning of attractiveness judgements and impressive cross-cultural consistency indicate that individuals around the world respond fairly similarly to facial attributes. Evolutionary psychologists consider that attractive faces are considered so as to advertise some kind of heritable quality, an attractive face is a "health certificate" indicating an individual's value as a mate. Selection has favored preferences for healthy, fertile mates (Thornhill & Gangestad, 1999).

Previous research has concentrated on three characteristics of faces that may honestly advertise health and viability: symmetry, averageness, and the size of sexually dimorphic traits.

An influential theory of facial attractiveness is that average facial configurations are optimally attractive; as such, faces are thought to indicate high levels of heterozygosity in their owners (Symons, 1979; Thornhill & Gangstad, 1999). Because genes in an individual lead to the development of proteins that form the environment for parasites, and because these pathogens are generally best adapted to proteins that are common in the host population, rare alleles in a host may result in rare proteins that pathogens are poorly adapted to. Average faces, indicating heterozygosity, may therefore be preferred, as their owners may be more likely to possess proteins to which pathogens have not adapted. Additionally, extreme (non-average) genotypes are more likely to be homozygous for deleterious alleles (Thornhill & Gangstad, 1999). A preference for averageness is compatible with both cognitive theories of prototyping (Langlois & Roggman, 1990) and work in theoretical biology that suggests a preference for "average" phenotypes would rapidly replace random mating (Koeslag, 1994). The averageness hypothesis, however, has received only mixed empirical support. While early studies favored the hypothesis (Langlois & Roggman, 1990), other studies find that although averageness is certainly attractive, it can be bettered. Consistent deviations from averageness lead to an increase in attractiveness in both male and females faces (Perrett et al., 1994, 1998; Grammer & Thornhill, 1994). Average composite faces tend to have smooth skin and be symmetric; these factors, rather than averageness per se, may lead to the high attractiveness attributed to average faces (Alley

and Cunningham, 1991). Dissociating symmetry and averageness is problematic, but a recent paper by Rhodes, Sumich & Byatt, (1999) varied averageness and symmetry independently and found that both contributed to attractiveness judgements. On the other hand, Pollard, Shepherd & Shepherd, (1999) used facial-metric measurements of feature-size rather than composites to calculate averageness, and found that faces with features close to the mean size of the population studied were rated as average, rather than high, in attractiveness. Several commentators have suggested that the attractiveness of average facial configurations could be due solely to associated changes in symmetry. If this symmetry hypothesis is correct, then averageness should not account for significant variance in attractiveness ratings when the effect of symmetry is partialled out. Changes in attractiveness produced by manipulating the averageness of individual faces should disappear when all the images are made perfectly symmetric. Symmetry and averageness (or distinctiveness, the converse of averageness) made independent contributions to attractiveness, and changes in attractiveness resulting from changes in averageness remained when the images were made perfectly symmetric. The results rule out the symmetry hypothesis and strengthen the evidence that facial averageness is attractive (Pollard et. al., 1999).

There is a prediction that facial symmetry is attractive by manipulating the symmetry of individual faces and observing the effect on attractiveness. By examining whether natural variations in symmetry (amongst faces) correlates with perceived attractiveness. Attractiveness increases when symmetry is increased, and decreases when it is reduced, in individual faces, and natural variations in symmetry correlates significantly with attractiveness. Perfectly symmetric versions, made by blending the



normal and mirror images of each face, were preferred to less symmetric versions of the same faces (even when those versions were also blends). Similar results were found when subjects judged the faces on appeal as a potential life partner, suggesting that facial symmetry may affect human mate choice. It is concluded that facial symmetry is attractive and we as humans have a preference for symmetry (Pollard et al., 1999).

Despite the attractiveness of average faces, consistent deviations from average feature proportions result in increased attractiveness ratings. In other species, females exhibit preferences for exaggerated secondary sexual characteristics in males. The peacock's tail is often cited as a classic example of "honest advertisement," whereby males demonstrate their quality by displaying costly ornaments. In mammals, the growth of secondary sexual traits is linked to levels of androgens (Owens & Short, 1995), which depress immune system function (Folstad & Karter, 1992). Only males in good physical condition can bear the "handicap" of large secondary sexual traits that represent an honest advertisement of male viability. Differences in levels of male and female sex hormones at puberty are thought to largely account for sex differences in adult face shapes. High testosterone levels cause forward growth of the brow ridges, and an increase in the size of the bones of the jaw, lower face and cheekbones-- "masculine" facial features (Thornhill & Gangstad, 1999). Estrogen inhibits this growth, leading to "feminine" face shapes with high eyebrows, gracile jaws and fuller lips. A preference for sex typical traits may operate in females' judgements of male facial attractiveness, and male's preferences for female faces. Considerable evidence suggests that extremely feminine female faces are considered attractive. A wide variety of techniques ranging from measurement of facial photographs of women (Grammer &

Thornhill, 1994), through studies of facial composites to the generation of attractive female face shapes using genetic algorithms (Johnston & Franklin, 1993) indicate that feminine features indicating estrogenized female faces increases their attractiveness cross-culturally. Sex typical female features (i.e., small lower face, a relatively flat mid-face, full lips and high eyebrows associated with a lack of brow ridge prominence) may indicate youth (as estrogen levels decrease in adult females with age), and reproductive health (Symons, 1979, 1994; Thornhill and Gangstad, 1999). Studies indicate that femininity (caused by an exaggeration of sex typical features), rather than averageness, is attractive in female faces. Given the probable "signaling" properties of estrogenized female faces, a male preference for such features is potentially adaptive.

There is some evidence for female preferences for exaggerated male facial characteristics. Scheib, Gangstad & Thornhill (1990) found a positive relationship between attractiveness and two markers of facial masculinity (i.e., cheekbone prominence and jaw size). Cunningham (1990) and Grammer and Thornhill (1994) used facial-metric measurements and found a female preference for large jaws in males. "Masculine" features, such as a large jaw and a prominent brow ridge are reliably associated with ratings of dominance in photographic and composite stimuli (Berry & Wero, 1993; McArthur & Berry, 1987; Perrett 1998). Facial dominance appears to correlate with status in some human hierarchies (Mueller & Mazur, 1997) and facial dominance in adolescent males is associated with earlier age at first sexual experience (Mazur, Haldern Udry, 1994).

The relationship between facial dominance and attractiveness is unclear. Studies find a positive relationship (Keating, 1985) while others find preferences for

"feminized" or "baby-faced" male faces (Perrett, Lee, Penton-Voak, Rowland, Yoshikawa, Burt, Henzi, Castles & Akamatsu, 1998). The failure of researchers to agree on the characteristics of attractive male faces is especially interesting, as the predictions from cross-species literature are clear. Females tend to prefer exaggerated male traits in most species (Andersson, 1994). Female preferences for "feminine" or "baby" male faces can perhaps be explained in terms of the personality attributions that such faces attract. Although biological hypotheses suggest that masculinized faces should be preferred, such faces elicit negative personality attributions (i.e., coldness, dominance, and dishonesty). Cross-culturally, personality factors are reported to be the most important factor in mate choice by both sexes (Buss, 1989). It seems inconceivable that personality attributions have no effect on attractiveness judgements. Personality attributions, though stereotypic, may predict behavior. For example, ratings of perceived dishonesty from facial appearance correlate with the face owner's willingness to participate in deceptive behavior (Bond, Berry & Omar, 1994). Less masculine male face shapes may increase in attractiveness because the features usually perceived to be associated with negative personality traits are "softened."

One theory on sexual attraction predicts that heterosexual men and women rate traditionally gender-typed opposite-sex individuals as more sexually attractive than less gender-typed individuals. This study used facial electromyography (EMGH) techniques to investigate the effects of perceived physical attractiveness of a target on female viewers' facial muscle activity and self-reported emotion. Twenty-three female subjects (aged 21-46 yrs.) viewed slides of adult males and females that varied in attractiveness. When these subjects viewed same-sex stimuli, the highly attractive targets evoked

greater mean corrugator muscle (i.e., brow lowering muscle) EMGH and greater reported arousal than the less attractive targets, while reported pleasure was not affected by perceptions of same-sex-stimulus attractiveness. When the subjects viewed males, ratings of felt pleasure, arousal and, to a lesser extent, zygomatic EMGH were all greater in response to the highly attractive males than the less attractive. The greater corrugator EMGH to highly attractive same-sex targets is interpreted as evidence of a defensive reaction to viewing a high-status competitor (Bond, et. al., 1994).

Testosterone-dependent secondary sexual characteristics in males may signal immunological competence and are sexually selected for in several species. In humans, estrogen-dependent characteristics of the female body correlate with health and reproductive fitness, which are found attractive. Enhancing the sexual dimorphism of human faces should raise attractiveness by enhancing sex-hormone-related cues to youth and fertility in females, and to dominance and immunocompetence in males (Grammer & Thornhill, 1994).

Japanese subjects and Caucasian subjects from Scotland were to choose the most attractive faces from continua that enhanced or diminished differences between the average shape of Japanese and Caucasian female and male face stimuli. As predicted, subjects preferred feminized to average shapes of a female face and to average or masculinized shapes of a male face. This preference applied across UK and Japanese populations but was stronger for within-population judgment, which indicates that attractiveness cues are learned. Overall, results indicate a selection pressure that limits sexual dimorphism and encourages neoteny in humans. In humans, paternity uncertainty results from internal fertilization, concealed ovulation, limited visual

similarity between off-spring and their fathers, and the apparently cross-cultural finding that couples prefer to copulate clandestinely (Christenfeld & Hill, 1995; Pagel, 1997; Schroder, 1993). Rates of extra-pair paternity are certainly non-zero cross-culturally, although precise levels are unknown due to a lack of well-controlled studies (Macintyre & Sooman, 1991). What little is known about patterns of sexual behavior across the menstrual cycle indicates that sex outside of a pair bond is more likely to occur mid-cycle (Baker & Bellis, 1995). Females may subconsciously balance the costs and benefits of various reproductive strategies in the context of life history factors, preferring relatively feminine looking males when looking for long-term investment in offspring, or more masculine men when heritable benefits are judged to be more important. Alternatively, some women may adopt a mixed reproductive strategy in a primary partner whose relatively feminine appearance suggests co-operation in parental care by occasionally seeking extra-pair copulation's with "masculine" males when conception is most likely, and hence benefit without cost. Similar patterns of sexual activity are found in non-human species (Graves, Ortega-Ruano & Slater, 1993; Andersson, 1994).

The approaches to facial attractiveness briefly described above have revealed considerable agreement on which faces are attractive across cultures and individuals. While cultural values play important roles in physical attractiveness judgements, biological signaling also seems to play a significant part. Hinsz (1989) conducted a study of facial similarity within real life partnerships. The stimuli in this experiment were photographs of the individuals in thirty, engaged couples and thirty couples who had been married for around twenty-five years. The subjects were presented with

opposite sex pairs of photos, and then asked to rate the similarity between the two faces. Half of the pairs presented were actual couples, and the other half were randomly generated couples. A significant real vs. random couple effect was discovered; real couples were rated as more similar than randomly generated couples. Couples that had been together for longer periods of time were not perceived as more similar than new couples in the Hinsz (1989), experiment. Penton-Voak, Perrett, Castles, Burt, Koyabashi & Murray, (1999) adopted a different approach in order to study similarities between partners, by studying preferences for faces, rather than looking at real couples. Individuals were photographed and the resulting image was "gender transformed" using computer graphics techniques to generate a hypothetical opposite sex "sibling." Ratings demonstrated that these computer-generated images were perceptually similar to the original photograph, indicating that the transforms were successful and credible. When the original subjects were asked to rate a set of photographs including their opposite sex "twin," they tended to rate faces similar to their own higher in attractiveness than those to which they were dissimilar. Whether this really represents a preference for self-similar faces is unclear as a preference for averageness could also generate these findings. Faces very far from average receive low attractiveness ratings and such atypical faces differ from the faces of most individuals more than average faces, possibly accounting for the result. There was also a trend found for individual subjects to rate opposite sex images with a similar face shape to their own face as more attractive than other subjects. No significant preferences for self-similar or opposite characteristics were found. It was found that preferences for average faces were stronger than preferences for a symmetrical face (Penton-Voak et al.1999).

Collectively, the findings of these partner similarity studies could be attributed to the development of weak preferences for family-like (i.e., self-similar) facial characteristics in life, although this is not the only possibility. An imprinting based explanation fails to explain the idiosyncrasies of the data generated, mere exposure and cross-racial bias on facial recognition and liability (Singh 1993).

In one experiment, forty Caucasian American female undergraduates (aged 18-40 yrs) and forty African American female undergraduates (aged 17-25 yrs) saw slides of either African American or Caucasian American female faces. In the second experiment, thirty-three Caucasian American and thirty-three African American College students (aged 18-32 yrs) saw slides of female faces of both races. Approximately half of the participants received instructions and forms for recognition responses, whereas the other half received instructions and forms for attraction responses. The attraction scores in both experiment 1 and 2 revealed an exposure effect when participants viewed Caucasian American faces but not when they viewed African American faces. There was no evidence of cross-racial bias in experiment 1. Experiment 2 revealed some evidence of cross-racial bias, in the finding that Caucasian Americans performed more poorly and made more errors in recognition (Fallen & Rozin, 1985).

Fallen and Rozin 1985, study tested a cognitively based differential-processing hypothesis that explains previously reported face recognition findings. Previous research has shown that same-race, distinctive, and unattractive faces are recognized better than other-race, typical, and attractive faces. The differential-processing hypothesis states that respective use of configural and featural processing is responsible for these effects.

Thirty-six Caucasian and thirty-six Asian subjects rated pictures of faces for typicality and attractiveness. Recognition performance for these faces was then measured under conditions known to selectively impair configural processing (i.e. divided attention and inversion) or featural processing (spatial frequency filtering). It was expected that subjects would show the effects of race, typicality, and attractiveness in the control conditions of the experiments, but not under conditions of divided attention or inversion, since these manipulations have been shown to decrease the availability of configural information. In the spatial frequency experiment, it was expected that the effects of race, attractiveness, and typicality would be increased since featural information would be unavailable from low-pass filtered faces. Seventy-two Caucasian and seventy-two Asian subjects participated in the divided attention study, and forty-eight Caucasian and forty-eight Asian subjects participated in each of the other experiments. In the divided attention and spatial frequency experiments there was a generalized recognition decrement resulting from the experimental manipulations, but no difference in the pattern of recognition based on race. Therefore, neither experiment provided support for the differential-processing hypothesis. The inversion study, however, showed a somewhat different result, in that Caucasian subjects recognized Caucasian faces more often than African American faces in the upright condition, but not in the inverted condition, consistent with the proposal that Caucasians tend to process Caucasian faces configurally, and African American faces featurally. Typicality and attractiveness were unrelated to recognition ability except for inverted Asian faces. Overall, the differential-processing hypothesis received only limited support. The most interesting result was a consistent 'other-race' effect for Caucasian subjects, but not for Asian subjects. Exposure to other-race faces may be critically



important for understanding the other-race effect. Understanding of the effects of familiarity on face recognition is necessary for understanding the effects of race, attractiveness, and typicality (Lopez, Blix & Gray, 1995; Rosen & Gross, 1987).

Dion (1990) claims that physical attractiveness stereotyping (PAS) is weaker among people from collectivist societies, whereas N. Y. Chen, (1997) argues that PAS is a strong phenomenon, the content of which varies across cultures. In a cross-cultural design, sixty-four American and seventy-three Taiwanese undergraduates made characterological inferences about attractive and unattractive American and Taiwanese stimulus persons. Consistent with the Chen, (1997) model, Taiwanese undergraduates actually showed as strong (or stronger) PAS of ethnic peers than did American undergraduates. Study 2, with three-hundred and three Taiwanese undergraduates, revealed that Taiwanese undergraduates who have most heartily embraced that society's push toward modernization closely resemble Americans, limiting their PAS of ethnic peers to individualistic (but not communal) attributes. Discussions centered on whether the Westernized pattern of judgments displayed by highly modernized Taiwanese undergraduates implied that these individuals are losing their respect for collectivist values (Chen, 1997).

Women who self-rated themselves as attractive preferred relatively more masculine facial composites than those women who rated themselves as low in attractiveness. In addition, the self-rated attractive women showed a preference for symmetric male face shapes that was not shown by women who rated themselves lower in attractiveness (Mock and Gieg, 1997). As both facial masculinity (size of sexually dimorphic traits) and symmetry are thought to be indicators of condition in men, and

therefore are possible cues to heritable genetic quality, these findings may represent a woman's adaptive response to an assessment of her own "condition." What is interesting about this finding is that the actual preferences for male faces are changed as a function of female self-rated attractiveness. The preferences of women who rate themselves as low in attractiveness do not represent conscious choices in response to past failure in competition for males but actual changes in criteria. Preferences contingent on the chooser's own condition may be adaptive in species where mate choice is costly and time consuming as in humans. Attractive faces appear to have some stable qualities that generalize across cultures and are salient to individuals very early in infancy, indicating that normative social information alone is unlikely to be responsible for attractiveness judgements. Averageness, symmetry and size of secondary sexual traits are proposed to be candidate features of facial attractiveness, as they may honestly indicate viability (Anderson, 1994).

Bodily symmetry is thought to be an indicator of developmental stability. Deviations from symmetry result from an organism's failure to cope with various inclement environmental (e.g., climate, malnutrition, parasitization) and genetic (e.g., inbreeding) factors (Moller, 1997). Better "quality" individuals may resist environmental hazards more effectively than poorer quality individuals; some of this quality may be heritable. As such, a preference for symmetry in sexual partners may have been favored by natural selection. In non-human animals, symmetry appears to be correlated with reproductive success (Moller & Thornhill, 1998).

Several researchers have studied the effects of symmetry on human sexual selection. Several studies failed to find any preference for symmetry in manipulated

human faces (Perrett, Burt, Penton-Voak, Lee & Rowland, 1999). These studies employed chimaeric facial stimuli: The images presented were mirror reflections of either the left or right side of an individual face. Chimaeric techniques may introduce unnatural artifacts such as double blemishes (spots or moles that are mirrored in both sides of the face) and unnatural feature sizes (an individual whose mouth is offset to the left will have an extremely wide mouth in left-left chimaeric pairs, or an extremely narrow mouth in right-right images) that reduce the attractiveness of the resulting stimuli. Studies of asymmetry in natural faces (Grammer and Thornhill, 1994) and more recent studies using manipulated, but not chimaeric, stimuli (Perrett et. al., 1999) indicate that facial symmetry does make some contribution to both male and female facial attractiveness in humans. Symmetry may act as a marker of phenotypic and genetic quality and is preferred during mate selection in a variety of species. Measures of human body symmetry correlate with attractiveness, but studies manipulating human face images report a preference for asymmetry. When the shape of facial features is varied (with skin textures held constant), increasing symmetry of face shape increases ratings of attractiveness for both male and female faces. These findings imply facial symmetry may have a positive impact on mate selection.

To study the role of shape symmetry in the absence of textural asymmetries used was a composite or blend of facial images (Benson and Perrett 1993; Perrett et. al., 1994). They created pairs of faces with normal (original) and symmetric shapes but with constant average skin textures. These faces were produced by blending fifteen facial images of the same sex into both the original shape and their symmetric shaped version

of each into the original face. What was found was that the more symmetrical a face, the more attractive the face was deemed.

Because faces very far from average receive low attractiveness ratings and such atypical faces differ from the faces of most individuals more than average faces, possibly accounting for the result of higher attractiveness. There was also a trend found for individual subjects to rate opposite sex images with a similar face shape to their own face as more attractive than other subjects. No significant preferences for self-similar or opposite characteristics has been found. It was found that preferences for average faces were stronger than preferences for a symmetrical face (Penton-Voak et. al.1999). Preferences, for self-similar or same ethnicity faces are unclear but deserve a lot more attention. As we as humans have preferences for averageness and symmetrical faces is more documented and studied phenomena this could generate finding in all areas of attractiveness and likability.

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Running head: CROSS-RACIAL ATTRACTIVENESS AND SOCIAL

Cross-Racial Attractiveness, Social Desirability and Culpability

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### Abstract

Symmetry and averageness is a marker of phenotypic and genetic quality that is preferred during mate selection. Attractiveness has been shown to influence how we perceive others. However, studies of attractiveness have generally examined the perception of Caucasian targets; few studies have examined inner-ethnic perceptions of attractiveness and attributions of personality traits. No data are available for perceptions of Caucasians and Aboriginals of each other. Caucasian and Aboriginal persons viewed one of four photographs (Caucasian or Aboriginal, attractive or unattractive) and rated it for attractiveness, social desirability and culpability in a court room scenario. There are differences, particularly in the way we view less-attractive targets.

In cross-racial attractiveness symmetry in addition with other innate reasoning plays a key role in the development of traits which affect our mate selection and preferences. Symmetry may act as a marker of phenotypic and genetic quality and is preferred during mate selection in human beings (Perrett, Burt, Penton-Voak, 1999). Studies, where manipulation of the human face reports a preference for asymmetry (Grammer, Thornhill, 1994). When the shape of facial features is varied (with skin textures held constant), increasing symmetry of face shape increases ratings of attractiveness for both male and female faces across all races (Perrett et al., 1999).

Paleontological information about males and females of different ages, races, cultures, varied geographical regions shows a commonality in their judgments of beauty of the human form. There is high agreement in judging the attractiveness of shape and proportions in line drawings of the human form. These studies indicate that general aesthetic sense for art, architecture, and fashion may be based on a subliminal preference for derived anatomical shapes and proportions. Derived traits are universally shared by the modern human and may be the standard for an innate sense of beauty of the human form (Langlois, Roggman, Casey, Ritter, Riser-Danner, Jenkins, 1987).

Averageness (or distinctiveness, the converse of averageness) made independent contributions to the preferences of attractiveness, and changes in attractiveness resulting from changes in averageness (Pollard, Shepherd, Shepherd, 1999).

Different studies have shown children prefer faces rated as highly attractive by adults over faces rated as quite unattractive (Langlois, Ritter, Roggman, Vaughn 1991). Children however show less pronounced preferences between face stimuli than the adults. The results suggest a role of developmental factors in the perception of facial

attractiveness (Slater, Von der Schuleberg, Brown, Badenoch, Butterworth, Parsons, Samuels, 1998).

A theory on sexual attraction, predicts that heterosexual men and women will rate traditionally gender-typed opposite-sex individuals as more sexually attractive than less gender-typed individuals (Anderson, 1994). When subjects view same-sex stimuli, the highly attractive targets evoked greater mean corrugate muscle (brow lowering muscle) EMGH and greater reported arousal than the less attractive targets while reported pleasure was not affected by perceptions of same-sex-stimulus attractiveness. When the subjects viewed males, ratings of felt pleasure, arousal, and to a lesser extent zygomatic EMGH were greater in response to the highly attractive males than the less attractive. This interpretation is that the highly attractive same-sex target is a defensive reaction to viewing a high-status competitor (Bond, Berry, Omar, 1994). In females, estrogen-dependent characteristics correlate with health and reproductive fitness and are found attractive, despite race (Thornhill, Gangestad, 1999).

In one study, Japanese subjects and Caucasian subjects were asked to choose the most attractive faces from continua that enhanced or diminished differences between the average shape of Japanese and Caucasian female and male face stimuli. Subjects preferred feminized to average shapes of a female face and to average or masculinized shapes of a male face. This preference applied across UK and Japanese populations but was stronger for within-population judgment, which indicates that attractiveness cues are learned. The results indicate a selection pressure that limits sexual dimorphism and encourages neoteny in humans (Christenfeld, Hill, 1995; Pagel, 1997; Schroder, 1993). When the effects of exposure and cross-racial bias on facial recognition and likability of

Caucasian American females and African American females saw slides of either African American or Caucasian American female faces. There was no evidence of cross-racial bias, however it revealed some evidence of cross-racial bias. Caucasian Americans performed more poorly and made more errors in recognition.

This study tested a cognitively based differential-processing hypothesis that explains previously reported face recognition findings (Fallen, Rozin, 1985). Research has shown that same-race, distinctive, and unattractive faces are recognized better than other-race, typical, and attractive faces. The differential-processing hypothesis states that respective use of configurable and featural, processing is responsible for these effects (Cash, Henry, 1995).

In another cross-racial study, thirty-six Caucasian and thirty-six Asian participants rated pictures of faces for typicality and attractiveness. Recognition performance for these faces was then measured under conditions known to selectively impair configurable processing (i.e. divided attention and inversion) or featural, processing (i.e. spatial frequency filtering). It was expected that subjects would show the effects of race, typicality, and attractiveness in the control conditions of the experiments, but not under conditions of divided attention or inversion, since these manipulations have been shown to decrease the availability of configurable information. In the spatial frequency experiment, it was expected that the effects of race, attractiveness, and typicality would be increased since featural information would be unavailable from low-pass filtered faces. In the divided attention and spatial frequency experiments there was a generalized recognition decrement resulting from the experimental manipulations, but no difference in the pattern of recognition based on race (Lopez, Blix, Gray, 1995; Rosen, Gross,

1987). This study provides support for the differential-processing hypothesis. The inversion study yields a somewhat different result. Caucasian subjects recognized Caucasian faces more often than African American faces in the upright condition, but not in the inverted condition, consistent with the proposal that Caucasians tend to process Caucasian faces configurally, and African American faces featurally. The differential-processing hypothesis receives only limited support by psychological community. Exposure to other-race faces may be critically important for understanding the other-race effect (Chen, 1997). Physical attractiveness stereotyping (PAS) is weaker among people from collectivist societies. PAS and the content of which varies across cultures (Dion, 1990). In another study a cross-cultural design, Americans and Taiwanese made characterological inferences about attractive and unattractive American and Taiwanese stimulus persons. Taiwanese showed as strong (or stronger) PAS of ethnic peers than did Americans. A second study, in which Taiwanese revealed that Taiwanese who have most heartily embraced that society's push toward modernization closely resemble Americans, limiting their PAS of ethnic peers to individualistic (but not communal) attributes. The discussions centers on whether the Westernized pattern of judgments displayed by highly modernized Taiwanese that these individuals are losing their respect for collectivist values (Chen, 1997).

All literature to date reports those persons of different ethnic backgrounds deem attractiveness as the most important quality and that cross-racial attractiveness is secondary. Between Aboriginal and Caucasians do we perceive them as more attractive, sociably desirable and more culpable for a wrong committed? Do we find this when the attractiveness was pre-established?

## Method

### Participants

The final sample consisted of 101 participants in total, of which 49 were Aboriginal and 52 were Caucasian. The participants were both male and female first year, university, college students and randomly chosen individuals from the general population. To have a good representation of Aboriginal participants, Native study classes were also approached at Algoma University. The age of the participants ranged between 18 and 45, with a mean age of 24.14. In consultation with professors, university students were given partial course credit for their participation.

### Materials

A sample of 24 female facial photographs ranging in ages from 19 to 27 (12 attractive Caucasian females and 12 attractive Aboriginal females) was assembled from a variety of magazines. The two most attractive photographs used for the experiment proper were chosen by a pilot study. The pilot study panel consisted of Aboriginal (5 male and 5 female Aboriginal) pre-judging the attractive Aboriginal photographs. The Caucasian pilot study panel consisted of (5 male and 5 female Caucasians) pre-judging the attractive Caucasian photographs. The pre-judges rated the levels of physical attractiveness of each target photo using a 7-point scale. Responses ranged from least attractive (1) to most attractive (7). To avoid confounding attractiveness with familiarity, judges were also asked to report whether the target was recognizable and if so that particular photo was discarded. The photograph rated highest in attractiveness in each set of Aboriginal and Caucasian photographs was chosen for the experiment proper. To create a matched unattractive target photo for both the attractive target photo's had to be



digitally modified to be equally unattractive. The attractive photos were digitally modified equally in the following manner (a) thinning of the lips (b) enlarging the tip of the nose (c) increasing the distance between the eyes, and (d) pinching the eyes. Four photos in total (1-attractive Aboriginal, 1 matched unattractive Aboriginal, 1-attractive Caucasian, 1 matched unattractive Caucasian) were used for the experiment proper.

### Design

A 2 x 2 x 2 x 2 between-groups factorial design was used. The independent variables was target ethnicity, target attractiveness, participant gender and participant ethnicity. The dependent variables were the ratings for attractiveness, social desirability and the degree of blame ascribed to the suspect in question (i.e. 1 - 7), length of sentence (i.e. probation – 2 years less a day incarceration).

### Procedure

Upon arrival, participants were individually seated at a computer or brought to a quiet area. The participants were given a numbered envelope; inside was a questionnaire asking their age, gender, and ethnicity. The numbered envelope had significance for it randomly assigned the participant to one of the four target photographs for rating. The envelope number also identified which participant rated what target photograph. Also when randomly assigning the participants to one of the 4-target photographs, it was made sure that there was an equal number of Aboriginal and Caucasian male and female participants in each target group. The participants were instructed to rate the target photograph for attractiveness. The participants judged either a photograph of a (a) attractive Aboriginal (b) unattractive Aboriginal (c) attractive Caucasian (d) unattractive

Caucasian, and rated them on a seven point scale. The rating scale is a 7-point scale, (1) being the least attractive and (7) the most attractive.

The participants then were required to rate each photo on a 7-point scale for social desirability using the 27 bipolar trait model (Dion & Dion, 1972), again 1- being the least socially desirable and 7-being the most socially desirable. These traits include the following, effectiveness and congeniality, submissive-assertive, sociable-unsociable, independent-dependent, exciting-dull, productive-unproductive, uncertain-certain, organized-disorganized, friendly-unfriendly, selfish-generous, out-going-with-drawn, kind-cruel, insensitive-sensitive, ambitious-not ambitious, happy-unhappy, dishonest-honest, late-prompt, reliable-unreliable, popular-unpopular, wealthy-poor, creative-not-creative, not-healthy-healthy, funny-not funny, intelligent-unintelligent, emotionally stable-emotionally unstable, loving-unloving, materialistic-non-materialistic, pessimistic-optimistic. After the participants were finished their rating for each of the 4-target photographs, a sum of the social desirability was calculated in each category (attractive Aboriginal, non-attractive Aboriginal, attractive Caucasian, non-attractive Caucasian).

The participants were then given a written legal scenario of embezzlement and asked to rate the target photograph on again a 7-point scale for culpability (blameworthiness), 1-being the least culpable and 7-being the most culpable. After the participants rating for culpability they were asked to impose a sentence of either probation, 3 – 6 months, 6 months – one year, or two years less a day.

## Results

### Manipulation Check

#### Attractiveness

A manipulation check of the attractiveness of the target photo was necessary in order to be certain the attractive targets were deemed to be significantly attractive than the unattractive photos. An analysis of the attractiveness variable was computed by using a 2 (Photo Attractiveness: Attractive/unattractive) X 2 (Participant Sex: Male/Female) X 2 (Photo Ethnicity) X 2 (Participant Ethnicity) mixed ANOVA. Both the attractive and unattractive Caucasian photograph was rated higher for attractiveness by the male and female Caucasian judges, with a (M 4.0, .8165 SD) for the attractive and (M 3.8, 1.63 SD, for male and M 3.0 for female) for the unattractive Caucasian photograph.

The Aboriginal male judges rated the Caucasian attractive photograph slightly higher than that of the attractive Aboriginal (M 5.5, 1.25 SD). The Aboriginal female judges rated the Aboriginal attractive photograph as slightly higher for attractiveness (M 4.4, 1.01 SD). For both male and female Aboriginal judges the rating for the unattractive Aboriginal photograph was higher (M 3.8, 1.69 SD for male and M 3.5, 1.41 SD) for female participants.

#### Social Desirability

An analysis of the social desirability index was computed by using a 2 (Photo Attractiveness: Attractive/unattractive) X 2 (Participant Sex: Male/Female)

X 2 (Photo Ethnicity) X 2 (Participant Ethnicity) mixed ANOVA. A sum was tallied for social desirability. Both the attractive and unattractive Caucasian photograph was summed to be higher for social desirability by the male and female Caucasian

judges. With a (total-85 for male and t-79 for female) for the attractive Caucasian photograph and (t-96 for male and t-89 for the female) for the unattractive Caucasian photograph.

Both the attractive and unattractive Aboriginal photograph was summed to be higher for social desirability by the male and female Aboriginal judges. With a (t-92 for male and t-111 for female) for the attractive photograph and (t-93 for male and t-94 for the female) for the unattractive photograph.

#### Culpability (blameworthiness)

An analysis of variance was performed for culpability. Both the attractive and unattractive Caucasian photograph was rated higher for culpability (blameworthiness) by the male and female Caucasian judges. For the attractive Caucasian (M 6.3, .817 SD, for male and M 6.1, .690 SD for female), for the unattractive (M 6.0, .817 SD for the male and M 5.9, .976 SD) for the Caucasian unattractive photograph.

The Aboriginal male and female judges rated the Caucasian attractive photograph slightly more culpable than that of the attractive Aboriginal (M 5.5, .756 SD for the male and M 6.0, .983 SD for the female). The Aboriginal judges rated the unattractive Caucasian photograph as slightly more culpable (M 6.2, .725 SD for male judges and M 5.8, .983 SD for female judges).

#### Sentence Length

For sentence length, Caucasian judges imposed a much stiffer sentence for both the attractive and unattractive Aboriginal females. They had a M 4.3, 1.26 SD attractive and M 2.6, 1.13 SD unattractive for the male participants and M 3.9, 2.33 SD attractive and M 3.0, 1.67 SD for the female participants.

For sentence length, Aboriginal judges imposed a stiffer sentence for the attractive Caucasian photograph ( $M$  3.0, 1.82 SD by male and  $M$  4.0, 1.30 SD) by female participants. However the Aboriginal judges of both male and female imposed a stiffer sentence for the unattractive Aboriginal than that of the Caucasian  $M$  4.5, 2.30 SD for the male and  $M$  3.5, 1.67 SD for the female participants.

Significant interaction analysis was shown for participant gender  $F$  (4.66)  $p=0.034$ , and photograph attractiveness interaction with participant gender  $F$  (9.07)  $p=0.003$ .

### Discussion

It has been hypothesized that the unattractive female targets would receive the longest conviction rates, and the lengthiest sentences regardless of their ethnicity. What was found was that Caucasian participants viewed the unattractive Aboriginal target as much less attractive than the unattractive Caucasian. The Aboriginal participants viewed the unattractive Caucasian as much less attractive than that of the unattractive Aboriginal target. For attractiveness it does seem that ethnicity does seem to play a role in our perception of what is attractive. The participant even though it showed a small significance, it was enough to show that Caucasians viewed their own race more favorably. Aboriginal perception of attractiveness was the same as The Caucasian race preference.

For social desirability Caucasian participants viewed unattractive Aboriginal as the least sociably desirable. Aboriginal participants viewed unattractive Caucasian as the least sociably desirable. Again for social desirability it shows that ethnicity does play a role in preference for our own race.

For culpability all target photographs were deemed to be extremely and equally culpable. Where the difference came in was that the attractive targets were deemed to be more culpable than that of the unattractive. For sentence length Caucasians overall gave a shorter sentence to the unattractive Caucasians than that of the unattractive Aboriginal.

Social desirability and sentence length showed the greatest amount of variability cross-racially, Caucasian viewing Aboriginal and Aboriginal viewing Caucasians.

This topic deserves further investigation. We should look at social desirability rather than strictly concentrating on cross-racial attractiveness because it seems that the three (attractiveness, socially desirability and ethnicity) are all heavily interwoven.

Past researchers that have examined social desirability and cross-racial attractiveness. They had instructed participants to make judgments of these attributes after viewing only a photo of a person. This study differed in that the judgements were made on the same two photos before and after manipulation. We looked not only at attractiveness, social desirability and culpability but most importantly the role ethnicity plays in our perception of another individual.

I believe the difference I found between male and female participants in the attractive ratings was do to the male's preferring attractive females, unbeknownst to themselves for evolutionary purposes. Where as female participants did not think subconsciously of the evolutionary hypothesis (being of the same sex) and judged only for attractiveness and familiarity or lack of it. They differed in social desirability because the males found attractive targets more sociably desirable regardless of race whereas females judged on familiarity not being concerned with attractiveness as strongly as their male counter-part. The participants judged culpability somewhat equally, because of

being influenced more by attractiveness than ethnicity for both Aboriginal and Caucasian participants.

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