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What is good is beautiful: Face preference reflects desired personality

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Abstract

The current study examined whether desired personality influences face preference. Pairs of composite faces were made based on the faces that individuals differing in desired partner personality found most attractive. One composite represented a face most attractive to those desiring a particular trait and the other a face most attractive to those not desiring the same trait. Pairs were presented to different participants to ascertain whether the composites reflected the desired personality of the original raters. For several traits the composites did differ in perceived personality indicating that the personality desired in a partner is reflected in face preference: if a trait is desired then faces perceived to possess that trait are found more attractive than faces which do not possess that trait. These findings cast new light on the “what is beautiful is good” stereotype. What an individual desires in partner reflects what they consider “good”, and they find faces reflecting these desired traits as attractive – “what is good is beautiful”. Possessing personality traits that are attractive may be causal in making a face attractive.

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1. Introduction

In a classic social psychology study, [Dion, Berscheid, and Walster \(1972\)](#) found that strangers rated attractive people as possessing ‘socially desirable’ traits to a greater extent than unattractive people and that attractive people were also expected to lead better lives than unattractive people. For example, attractive individuals were thought to be able to achieve more prestigious occupations, be more competent spouses with happier marriages and have better prospects for personal fulfilment. There have been a wealth of studies examining this attractiveness stereotype, demonstrating that attractive people are seen in a positive light for a wide range of attributes compared to unattractive people (although some negative attributes, such as vanity, are attributed to attractive individuals, e.g., [Dermer & Thiel, 1975](#)). On the basis of such studies it has been suggested that there exists a stereotype associated with physical attractiveness, famously – “What is beautiful is good” ([Dion et al., 1972](#); see [Eagly, Ashmore, Makhijani, & Longo, 1991](#); [Feingold, 1992](#); [Langlois et al., 2000](#) for meta-analytic reviews of research on physical attractiveness stereotypes).

1.1. *Mature and masculine features*

Studies on attractiveness stereotypes have generally not addressed the particular characteristics of faces that make individuals either attractive or unattractive or the features that elicit personality attributions, although different faces reliably elicit the same personality attributions ([Hassin & Trope, 2000](#)). Work has been carried out on two physical characteristics of faces related to both attributions and attractiveness: facial masculinity/femininity and facial maturity/babyishness. Although the two continua vary, both share many common features, female faces remain relatively immature compared to male faces at puberty ([Enlow, 1990](#)) and female faces remain relatively baby-like in appearance.

Most studies agree on the characteristics that make male faces appear dominant: mature or masculine features, such as a large jaw and a prominent brow ridge are reliably associated with judges’ ratings of dominance in photographic, indenti-kit and schematic stimuli ([Berry & McArthur, 1985](#); [McArthur & Apatow, 1983–1984](#)). Similarly, the literature agrees that baby-like or feminine faces are characterised by smaller chins, high eyebrows and larger eyes. Such faces are generally rated as being warmer, more honest, and more sincere but also more naïve and less physically strong than more mature looking faces ([Berry & McArthur, 1985](#); [McArthur & Apatow, 1983–1984](#)).

Both baby-like and dominant facial qualities reliably elicit personality attributions cross-culturally (e.g., [Keating, 1985](#); [McArthur & Berry, 1987](#)) but their effect on attractiveness judgements is still in dispute. Despite findings showing a preference for more masculine and dominant male faces (e.g., [Grammer & Thornhill, 1994](#)), several studies have shown that feminine characteristics and faces of low dominance are of increased attractiveness ([Berry & McArthur, 1985](#); [Cunningham, Barbee, & Pike, 1990](#)). For example, [Perrett et al. \(1998\)](#) found that when participants were able to manipulate masculinity in a face directly both feminised male and feminised female faces were found most attractive by male and female judges. [Cunningham et al. \(1990\)](#) have suggested that a resolution to this conflict could be that very attractive male faces possess a combination of both masculine and feminine features, and so reflect ‘multiple motives’ in a woman’s choice of partner (i.e., the desire for a dominant and a co-operative partner).

1.2. *The relationship between attractiveness and personality judgements*

Personality traits are reported cross-culturally to be the amongst the most important factors in partner choice by both sexes (Buss, 1989; Buss & Barnes, 1986) and there is evidence for a positive correlation between partners for certain personality dimensions, which appears related to desired personality (Botwin, Buss, & Shackelford, 1997). If desired personality is so important and relates to real mate choice, in that similarity may be based on preferences for partners with similar personalities, it would appear likely that personality attributions elicited by a face would impact on its attractiveness. One theory to explain the attractiveness of feminine male faces over masculine male faces is that masculine faces may carry a cost – they are seen as less likely to co-operate and to make worse parents (Perrett et al., 1998). Females who value co-operation and good parenting may avoid masculine-faced males. Thus, instead of feminine faces being attractive and this attractiveness driving the positive personality attributions, it may be that the personality attributions are driving the attractiveness judgements. By similar logic, that baby-faced individuals are attractive may not reflect an attraction to individuals physically resembling infants but attraction to the positive personality attributions elicited by these features, such as warmth and honesty.

Individuals may use personality stereotypes in mate selection to select partners with a personality that they desire. Some perceptual attributions to facial photographs are somewhat accurate (e.g., Borkenau & Liebler, 1992) and so choosing a partner based on perceived personality may result in acquiring a partner who actually possesses desired personality traits. Consistent with such notions, Little, Burt, and Perrett (2006) demonstrate that partners receive similar attributions to their faces for several personality traits. For example, males who were seen as extraverted were likely to have partners who were also seen as extraverted. Attraction to faces based on personality stereotypes may happen regardless of whether attributions are accurate or not, especially as many individuals do believe the face provides important guides to character (Hassin & Trope, 2000; Liggett, 1974). In fact, it is possible that visually appearing to possess certain traits may be more important in initial selection processes than actually possessing desired traits because the visual stereotypes are more easily available than information about stable behaviour.

1.3. *Rationale*

People differ in their preferences for personality in partners and given the importance of personality in a partner (Buss, 1989) personality inferences about a face may influence that face's attractiveness. If so, individuals who desire a particular trait will find faces that appear to possess that trait more attractive. Here we tested this hypothesis by having opposite-sex faces rated for attractiveness and recording the expressed preferences for partner personality of the judges. We then used computer graphics to create composite faces that were most attractive to those desiring or not desiring particular personality traits. Galton (1878) devised the basic technique of combining individual images to produce composites. These techniques have been developed in recent years yielding ever more realistic looking composites (Benson & Perrett, 1992; Tiddeman, Burt, & Perrett, 2001). Characteristics common to the individual faces combined in composites are maintained and highlighted, while idiosyncratic variations that are not common to the set are 'averaged out'. Therefore, if desired personality traits are consistently linked to particular, visible

facial features in rated faces, these features should be maintained in composites, while irrelevant characteristics disappear.

2. Part 1: Desired personality and face ratings

2.1. Methods

2.1.1. Participants

Twenty-six males (mean age = 24.7, SD = 2.1) and 27 females (mean age = 24.0, SD = 1.0) participated in this part of the study.

2.1.2. Materials

Seventy-eight male and 61 female model faces acquired from magazine photographs were presented to participants. These faces were selected on the criteria that they were not wearing spectacles, did not have visible piercings, and were of white young adult appearance. The faces were cropped to remove hair and other background information such as clothing and were presented on a standard background.

Participants also filled in a questionnaire assessing their age, gender, sexuality and the personality traits they desired in a partner, using 10 questions (sexiness, warmth, assertiveness, competitiveness, easy-going nature, extraversion, maturity, relaxed nature, scatter-brained nature, responsibility). Questions were presented on a 5-point scale (1 – not desired, 5 – highly desired).

2.1.3. Procedure

Female participants were asked to rate all the 78 male faces and male participants were asked to rate all the 61 female faces for attractiveness using a 7-point scale. Faces were presented in a random order on printed cards and participants placed the face alongside its rating (numbers 1–7 were placed on a surface). The paper questionnaire assessing their partner personality preferences was then administered. An experimenter recorded the scores for each face once the participant had finished the experiment.

2.2. Results

High inter-rater agreement was found between attractiveness scores for both males judging female faces (Cronbach's $\alpha = .91$) and females judging male faces (Cronbach's $\alpha = .90$).

For all 10 questions a range in desire was found across individuals (Table 1). Some personality traits are desired in partners more than others. For example, both men and women value the traits warm and easy-going. However, despite population level (overall mean) preferences for particular personality traits there are individual differences in how much particular traits are desired in partners. There was also greater consensus for some traits compared to others. The small standard deviations for desired warmth indicate that there are smaller individual variations for this trait than for other traits with larger standard deviations.

Sex differences were also evident for desired personality traits. Males and females significantly differed in their desires for assertive ($t_{52} = 3.07$, $p = .003$), mature ($t_{52} = 2.56$, $p = .014$), relaxed

Table 1

Means, standard deviations and *t*-test results for male and female desired partner personality

	Females		Males		<i>t</i> -Test
	Mean	Standard deviation	Mean	Standard deviation	
Assertive	4.3	1.1	3.5	0.8	3.07*
Competitive	3	1	3.3	0.8	-1.41
Easy-going	4	0.8	4.3	0.7	-1.32
Extravert	3.1	0.9	3.3	0.9	-0.82
Mature	4.1	0.8	3.6	0.8	2.56*
Relaxed	4.2	0.9	3.6	0.9	2.53*
Responsible	4.3	0.9	4	0.8	1.48
Scatter-brained	1.9	0.9	2.6	0.9	-2.82*
Sexy	4.5	0.6	4.5	0.8	0.1
Warm	4.8	0.4	4.3	0.5	3.85**

* Significant at the 0.05 level.

** 0.01 level (2-tailed).

($t_{52} = 2.53$, $p = .014$), scatter-brained ($t_{52} = -2.82$, $p = .007$), and warm ($t_{52} = 3.85$, $p < .001$), with females desiring higher levels of assertive, mature, relaxed, and warm and lower levels of scatter-brained. Males and females did not differ in their desired partners' traits of responsible ($t_{52} = 1.48$, $p = .15$), sexy ($t_{52} = .10$, $p = .92$), extravert ($t_{52} = -.82$, $p = .42$), competitive ($t_{52} = -1.41$, $p = .16$), and easy-going ($t_{52} = -1.32$, $p = .19$).

3. Part 2: forced choice comparison of composites

3.1. Methods

3.1.1. Participants

Twenty females (mean age = 22.4, SD = 2.7) and 20 males (mean age = 27.0, SD = 8.1) participated in this part of the study.

3.1.2. Materials

The 78 male face and 61 female model face images from Part 1 were used to make average or composite images (Benson & Perrett, 1992). The data from Part 1 provided attractiveness ratings and desired personality from both male and female judges. Based on the attractiveness ratings made by participants desiring different personality traits a preference score was calculated which reflected how much the face was desired by individuals seeking a partner high on a personality trait as compared to individuals seeking a partner low on the personality trait. For each face, this preference score was calculated by multiplying participants' standardised personality preference rating by their standardised attractiveness ratings and then summing them together. Standardised personality ratings were calculated for each desired personality trait by converting all participants desired personality ratings for the trait to *z*-scores. Standardised attractiveness ratings were calculated by converting the attractiveness ratings given by each participant to *z*-scores, such that any individual participant's attractiveness ratings had a mean of zero and a standard deviation

of one. Adding the scores together created a preference score for each face, where high scores indicated it was a face attractive to those desiring the trait and low scores indicated it was a face attractive to those not desiring the trait. Based on the preference score for each face, the 15 faces most attractive to those expressing highest desire for a trait and the 15 faces most attractive to those expressing lowest desire for the trait were selected. The calculation of the preference score meant that different faces appeared in the high and low selections.

For each set of 15 faces a single composite face was produced. Using specialist software, key locations (174 points) were marked around the main facial features (e.g., points outline the eyes,

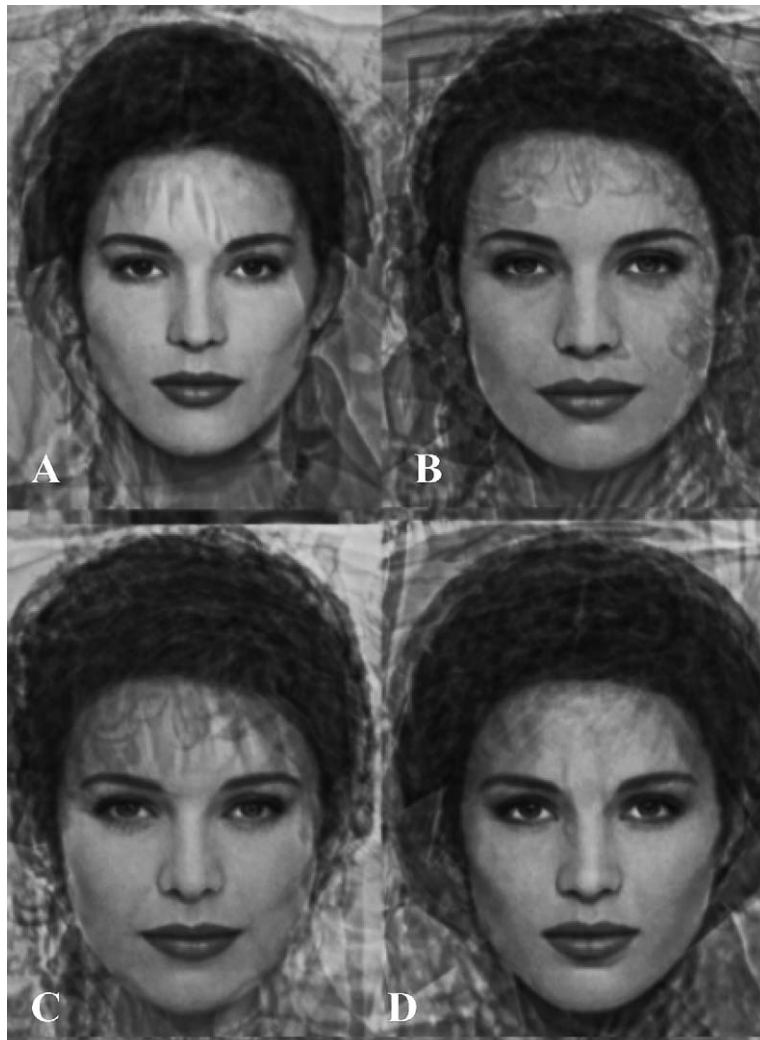


Fig. 1. Composite of faces found attractive by men desiring different personality traits. Top row: Composite of 15 faces most preferred by men not desiring an easy-going partner (A) versus composite of 15 faces most preferred by men desiring an easy-going partner (B). Bottom row: Composite of 15 faces most preferred by men not desiring an assertive partner (C) versus composite of 15 faces most preferred by men desiring an assertive partner (D).

nose, and mouth) and the outline of each face (e.g., jaw line, hair line). The average location of each point of the 15 component faces was then calculated to define the shape of the composite. The images of the individual faces were then warped to the relevant average shape before superimposing the images to produce a photographic quality result. For more information on this technique see Tiddeman et al. (2001). Examples of male and female composites can be seen in Figs. 1 and 2.

Composite images were labelled in terms of the trait and which group found them most attractive. For example “Easy-going high” was the composite found most attractive by those desiring

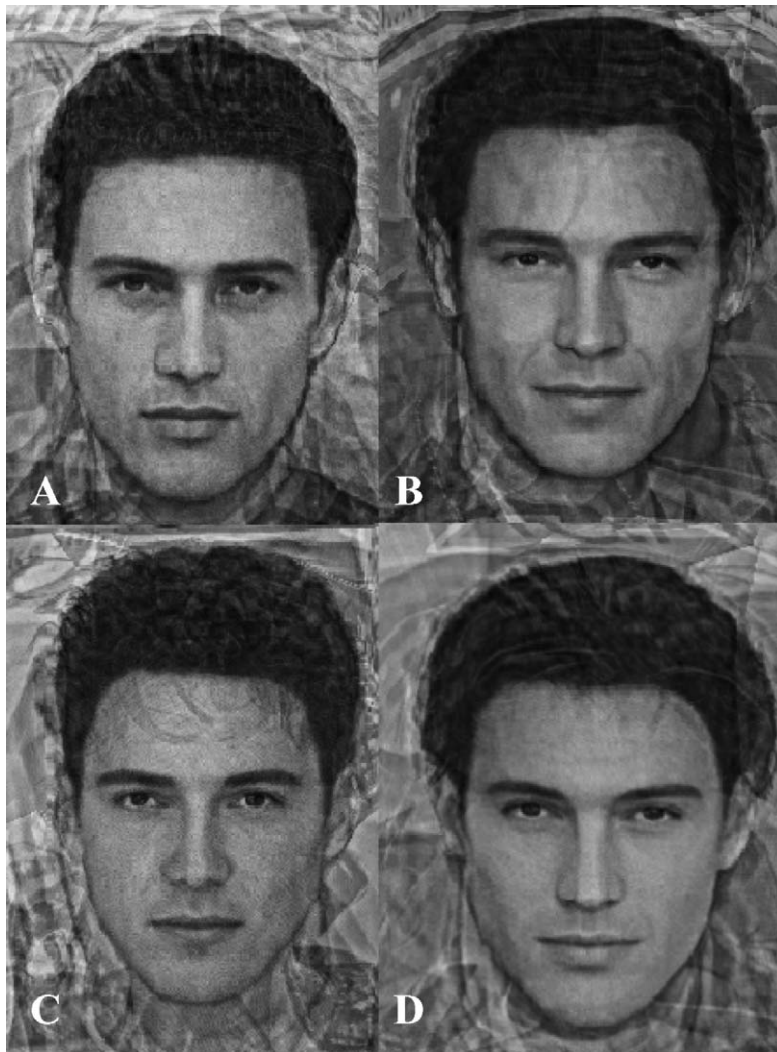


Fig. 2. Composite of faces found attractive by women desiring different personality traits. Top row: Composite of 15 faces most preferred by women not desiring an easy-going partner (A) versus composite of 15 faces most preferred by women desiring an easy-going partner (B). Bottom row: Composite of 15 faces most preferred by women not desiring an assertive partner (C) versus composite of 15 faces most preferred by women desiring an assertive partner (D).

an easy-going partner and “Easy-going low” the composite found most attractive by those not desiring an easy-going partner.

3.1.3. Procedure

Stimuli pairs were presented to participants by an experimenter and asked, “Which of the two faces looks most *X*” (e.g., *X* = easy-going) for each of the 10 traits for either male or female faces. The 10 pairs of each sex were presented in a random order and the side on which the high and low trait face appeared was also random. After the experiment participants were asked their age.

3.2. Results

3.2.1. Female composite faces based on male preferences

The number of times a face was correctly chosen as reflecting the trait desired by people who rated the constituents as attractive was analysed using χ^2 . For the traits assertive ($\chi^2 = 14.4$, $p < .0005$), easy-going ($\chi^2 = 12.1$, $p < .0005$), scatter-brained ($\chi^2 = 4.9$, $p = .027$), sexy ($\chi^2 = 12.1$, $p < .0005$) and warm ($\chi^2 = 25.6$, $p < .0005$), composite faces made from faces rated as attractive by those valuing such traits were also thought to possess the visual characteristics underlying that trait more than composite faces made from faces rated as attractive by those not valuing these traits. The faces chosen by those desiring a relaxed partner ($\chi^2 = 3.6$, $p = .058$) made up a composite that was seen as more relaxed than the composite of faces rated as attractive by those not desiring a relaxed partner though this did not reach significance. The composite faces made from faces chosen by those valuing and those not valuing the traits competitive ($\chi^2 = 0.0$, $p = .1$), extravert ($\chi^2 = 0.4$, $p = .53$), mature ($\chi^2 = 0.9$, $p = .30$) and responsible ($\chi^2 = 1.6$, $p = .21$) did not differ significantly in their visual characteristics for these personality traits. Examples of composites made from male preferences can be seen in Fig. 1 (Table 2).

3.2.2. Male composite faces based on female preferences

Again the number of times a face was correctly chosen as reflecting the trait desired by people who rated the constituents as attractive was analysed using χ^2 . For the traits, assertive ($\chi^2 = 25.6$,

Table 2
Chi-square results for the perceived personality of female composite faces made from male preferences

	Number choosing consistent (of 40)	% Choosing consistent	χ^2 (DF = 1)	<i>p</i>
Assertive	32	80	14.4	<0.0005
Competitive	20	50	0	1
Easy-going	31	78	12.1	<0.0005
Extravert	22	55	0.4	0.53
Mature	23	58	0.9	0.30
Relaxed	26	65	3.6	0.058
Responsible	16	40	1.6	0.21
Scattered	27	68	4.9	0.027
Sexy	31	78	12.1	<0.0005
Warm	36	90	25.6	<0.0005

Table 3

Chi-square results for the perceived personality of male composite faces made from female preferences

	Number choosing consistent (of 40)	% Choosing consistent	χ^2 (DF = 1)	<i>p</i>
Assertive	36	90	25.6	< 0.0005
Competitive	22	55	0.4	0.53
Easy-going	32	80	14.4	< 0.0005
Extravert	7	18	16.9	< 0.0005
Mature	21	53	0.1	0.75
Relaxed	23	58	0.9	0.34
Responsible	14	35	3.6	0.058
Scattered	33	83	16.9	< 0.0005
Sexy	38	95	32.4	< 0.0005
Warm	28	70	6.4	0.011

$p < .0005$), easy-going ($\chi^2 = 14.4$, $p < .0005$), sexy ($\chi^2 = 32.4$, $p < .0005$), scatter-brained ($\chi^2 = 16.9$, $p < .0005$), and warm ($\chi^2 = 6.4$, $p = .011$), faces rated as attractive by those valuing such traits were thought to possess the visual characteristics underlying that trait more than faces rated as attractive by those not valuing these traits. The faces chosen by those valuing and those not valuing competitive ($\chi^2 = 0.4$, $p = .53$), mature ($\chi^2 = 0.1$, $p = .75$), and relaxed ($\chi^2 = 0.9$, $p = .34$) traits did not differ significantly in their visual characteristics for these personality traits. The faces chosen by those valuing and those not valuing extravert ($\chi^2 = 16.9$, $p < .0005$) and responsible ($\chi^2 = 3.6$, $p = .058$) traits did differ in their visual characteristics for these personality traits but in a way opposite to that expected (in the case of extraversion significantly so). Examples of composites made from female preferences can be seen in Fig. 2 (Table 3).

4. Discussion

The present study demonstrates that a desire for some personality traits influences judgements of facial attractiveness. Individuals valuing particular personality traits find faces appearing to display these traits attractive. Conversely, those not valuing particular traits find faces attractive that are perceived to possess that trait less. Thus, desired personality influences perceptions of facial attractiveness in opposite-sex faces.

For the 10 traits examined it was obvious from the ratings that some were valued more than others were. For example, both men and women valued warmth but did not want a scatter-brained partner. There were also some significant differences between males and females in their desired traits. Women appeared more demanding of particular personality traits in their ideal partners, wanting partners who were more assertive, mature, relaxed and warm, and less scatter-brained than men. Such findings are consistent with evolutionary theories postulating that females are the more choosy sex and males are less discriminating in their partner choices, as is seen in many other species (see Andersson, 1994) and previous studies suggesting that personality is more important in female choice as opposed to physical attractiveness which is proposed to be relatively more important to males (e.g., Buss & Schmidt, 1993). It is interesting that, given such sex differences in desired personality, no differences were found in the number of traits (or which

traits were) found to reflect desired personality in the composite faces – from these results it does not appear that women are more influenced by facial personality attribution in attractiveness than men are.

The extent to which each pair of composites exemplified the associated personality trait differed within the significant results: some faces evidently captured the difference in the desired traits better than others. For example the composites for desired warmth were easier to discriminate (displayed greater perceptual difference) in terms of warmth than the composites made from ratings of participants desiring or not desiring scatter-brained partners. Some composites did differ based on desired personality and others did not. The traits assertive, easy-going, scatter-brained, sexy, and warm were more easily discriminated by both men and women suggesting that these traits are important to identify in partners. For female judges, the average preference for extraversion and competitiveness was slightly lower than the expressed preference for other traits. Lower preferences for these traits may result in the composites showing no perceptual difference. For traits that appear more important to judges (e.g., warm, assertive) the difference in the composites is more evident. It is possible that only traits considered important will impact on personality driven attractiveness judgements. Similar mean levels of desire for assertiveness and responsibility were found, however, and the assertiveness composites hold their traits whereas the responsible composites do not, which implies desirability alone did not determine which desired traits hold in the composites.

Our finding that personality preferences can alter face preferences (due to perceived personality differences present in faces) is theoretically important as it provides a new way to interpret the “What is beautiful is good” stereotype (Dion et al., 1972). Rather than just an unspecified characteristic of “attractiveness” driving the perception of personality, the personality traits elicited by a face can affect judgements of attractiveness. Valued or attractive personality traits may be causal in making a face attractive. What people desire in partners reflects what they, as individuals, consider “good”, and they find faces reflecting these desired traits attractive. Thus, facial attractiveness reflects “what is good is beautiful” reversing the causal logic of “what is beautiful is good”. Such an explanation works at both a population and an individual level. Certain traits are commonly valued more than others. If a trait is commonly valued in a population, then across observers faces perceived to display that trait will be found more attractive. For example, if most individuals value warmth in a partner then on average faces appearing warm will be found more attractive than those appearing cold. At an individual level, different desires for particular personality traits can also affect face preference. As individuals differ in their ideal partner personality then what is good for one person is not necessarily good for another, suggesting that a “what is good is beautiful” maxim is also a source of individual differences in attractiveness judgements. While we examined only opposite-sex faces, similar preferences may also be seen in friendship judgments between members of the same-sex.

The findings reported by Perrett et al. (1998) indicating that women prefer feminised male face shapes are also consistent with the current study. If, overall, women value co-operation, warmth and parental skill over dominance and maturity, then feminine male faces would be found attractive across a population. Of course, overall preferences for feminised face shapes and feminine personality traits still leave room for individual differences (Little, Burt, Penton-Voak, & Perrett, 2001; Little & Perrett, 2002). Some women may value dominance over parenting skill and these women may prefer more masculine face shapes.

Attractiveness judgements linked to desired personality may reflect an attempt by individuals to select partners with their ideal partner personality. For example, if an individual desires an agreeable partner, they may be more attracted to people with facial traits that are associated with agreeableness because it is believed that they may actually be more agreeable. Individuals may be attracted to particular individuals based on perceived personality regardless of whether personality attributions to faces are accurate or not. Thus, matching for facial cues to personality may account for some of the perceived facial similarity between partners reported in several studies (Griffiths & Kunz, 1973; Hinsz, 1989; Zajonc, Adelman, Murphy, & Niendenthal, 1987).

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References

- Andersson, M. (1994). *Sexual selection*. Princeton, NJ: Princeton University Press.
- Benson, P., & Perrett, D. I. (1992). Face to face with the perfect image. *New Scientist*, 133, 32–35.
- Berry, D. S., & McArthur, L. Z. (1985). Some components and consequences of a babyface. *Journal of Personality and Social Psychology*, 48, 312–323.
- Borkenau, P., & Liebler, A. (1992). Trait inferences: Sources of validity at zero acquaintance. *Journal of Personality and Social Psychology*, 62, 645–657.
- Botwin, M. D., Buss, D. M., & Shackelford, T. K. (1997). Personality and mate preferences: Five factors in mate selection and marital satisfaction. *Journal of Personality*, 65, 107–136.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioural and Brain Sciences*, 12, 1–49.
- Buss, D. M., & Barnes, M. (1986). Preferences in human mate selection. *Journal of Personality and Social Psychology*, 50, 559–570.
- Buss, D. M., & Schmidt, D. (1993). Sexual Strategies Theory: An evolutionary perspective on human mating. *Psychological Review*, 100, 204–232.
- Cunningham, M. R., Barbee, A. P., & Pike, C. L. (1990). What do women want? Facialmetric assessment of multiple motives in the perception of male facial physical attractiveness. *Journal of Personality and Social Psychology*, 59, 61–72.
- Dermer, M., & Thiel, D. L. (1975). When beauty may fail. *Journal of Personality and Social Psychology*, 31, 1168–1176.
- Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, 24, 285–290.
- Eagly, A. H., Ashmore, R. D., Makhijani, M. G., & Longo, L. C. (1991). What is beautiful is good, but . . . : A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin*, 110, 109–128.
- Enlow, D. H. (1990). *Facial growth* (3rd ed.). Philadelphia: Harcourt Brace Jovanovich.
- Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin*, 111, 304–341.
- Galton, F. (1878). Composite portraits. *Journal of the Anthropological Institute of Great Britain and Ireland*, 8, 132–142.
- Grammer, K., & Thornhill, R. (1994). Human (*homo sapiens*) facial attractiveness and sexual selection: The role of symmetry and averageness. *Journal of Comparative Psychology*, 108, 233–242.

- Griffiths, R. W., & Kunz, P. R. (1973). Assortative mating: A study of physiognomic homogamy. *Social Biology*, 20, 448–453.
- Hassin, R., & Trope, Y. (2000). Facing faces: Studies on the cognitive aspects of physiognomy. *Journal of Personality and Social Psychology*, 78, 837–852.
- Hinsz, V. B. (1989). Facial resemblance in engaged and married couples. *Journal of Social and Personal Relationships*, 6, 223–229.
- Keating, C. F. (1985). Gender and the physiognomy of dominance and attractiveness. *Social Psychology Quarterly*, 48, 61–70.
- Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallamm, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin*, 126, 390–423.
- Liggett, J. (1974). *The human face*. London: Constable.
- Little, A. C., Burt, D. M., Penton-Voak, I. S., & Perrett, D. I. (2001). Self-perceived attractiveness influences human female preferences for sexual dimorphism and symmetry in male faces. *Proceedings of the Royal Society of London, series B*, 268, 39–44.
- Little, A. C., Burt, D. M., & Perrett, D. I. (2006). Assortative mating for perceived facial personality traits. *Personality and Individual Differences*, 40, 973–984.
- Little, A., & Perrett, D. (2002). Putting beauty back in the eye of the beholder: Evolution and individual differences in face preference. *The Psychologist*, 15, 28–32.
- McArthur, L., & Apatow, K. (1983–1984). Impressions of baby-faced adults. *Social Cognition*, 2, 315–342.
- McArthur, L. Z., & Berry, D. S. (1987). Cross-cultural agreement in perceptions of babyfaced adults. *Journal of Cross-cultural Psychology*, 18, 165–192.
- Perrett, D. I., Lee, K. J., Penton-Voak, I. S., Rowland, D. R., Yoshikawa, S., Burt, D. M., et al. (1998). Effects of sexual dimorphism on facial attractiveness. *Nature*, 394, 884–887.
- Tiddeman, B. P., Burt, D. M., & Perrett, D. I. (2001). Prototyping and transforming facial texture for perception research. *IEEE Computer Graphics and Applications*, 21, 42–50.
- Zajonc, R. B., Adelman, P. K., Murphy, S. T., & Niendenthal, P. M. (1987). Convergence in the physical appearance of spouses. *Motivation and Emotion*, 11, 335–346.