

OBJECT-SUBJECT SIMILARITY IN FACIAL ATTRACTIVENESS ASSESSMENT (FOCUSING ON EXTRAVERSION AND INTELLIGENCE)

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Abstract: According to the theory of assortative mating, the similarity/attractiveness hypothesis and the theory of cognitive averaging, the attractiveness of a human face can be based on the degree of similarity with the personality features of the subject (beholder). The study tests this tendency with the example of two characteristics – extraversion and intelligence. The subjects (N=1,903) were male (N=754; 39.6%) and female Slovaks between 15 and 67 years of age. The T-test revealed there was no difference in the levels of self-reported extraversion between group which preferred a face high in extraversion and group which preferred a face low in extraversion. Similar results were gained for intelligence variable.

Keywords: Face, attractiveness, intelligence, extraversion, assortative mating.

1 Introduction

In research into human facial attractiveness, a variety of approaches can be seen. Besides the opinion that attractiveness is very subjective, multi-causally influenced and a variable aspect of the objects perceived (commonly represented by phrases such as: “De gustibus non disputandum est” or “Beauty is in the eye of beholder”), there are also a large number of cases that point to the fact that there is some consensus in standards of beauty evaluation. The vast majority of the research into the attractiveness of the human face reports that attractive faces are those that present with symmetry (see e.g., Fink, Neave, Manning, & Grammer, 2006; Jones, DeBruine, & Little, 2007; Little, Apicella, & Marlowe, 2007), averageness (Apicella, Little, & Marlowe, 2007; Komori, Kawamura, & Ishihara, 2009), apparent sexually dimorphic traits (Perrett et al. 1998; Burriss, Welling, & Puts 2011), etc. The explanation for the attractiveness of these features lies in their close connection with the genetic quality of the subject (Scheib, Gangestad, & Thornhill, 1999), their age (Burt & Perrett, 1997), overall health (Etcoff 1999), or fertility (Gray & Boothroyd, 2012). From this point of view, facial features serve as an honest signal for the potential of “good genes” in a perceived subject (Little, Jones, DeBruine, & Feinberg, 2008).

Another tendency observed in this area of research is a preference for faces that resemble the face of the observer. This has been proved in various extrinsic facial features such as: eye colour (see e.g., DeBruine, Jones, & Little, 2017), the shape of the eyes, nose, mouth, or chin (Wong, Wong, Lui, & Wong, 2018), or by facial adiposity (Fisher et al., 2014). However, within the evaluation of facial attractiveness, humans do not rely on purely extrinsic characteristics. They are also influenced by other factors, such as apparent social status (Buss, 1989), intelligence (Kazanawa, 2011; Démuth & Démuthová 2018), or personality features (Little, Burt, & Perrett, 2006) visible in the face.

The tendency to prefer partners similar to themselves has been explained by various theories. Firstly, the theory of assortative mating assumes that individuals have a tendency to mate with those who are similar to them in some way, to a higher degree than would be expected at random (Escorial & Martín-Buro 2012). Research undertaken in this area showed a significant degree of similarity between couples in various features of their personalities – e.g., in agreeableness, openness to experience (McCrae et al., 2008), cooperativeness, generosity (Tognetti, Berticat, Raymond, & Faurie, 2014), attachment avoidance and anxiety, positive and negative affectivity, ~~self-esteem~~, and sensation seeking (Luo, 2017).

Secondly, the similarity/attractiveness hypothesis states that

people are generally attracted to those who are similar to themselves (Wee & Lee, 2017). Individuals assess their characteristics and then select others who are similar. This process works to reduce the potential degree of conflict in their relationship (Byrne, 1971), or to reduce the psychological discomfort that may arise from cognitive or emotional differences (Lungeanu & Contractor, 2015). Studies that have proven the similarity/attractiveness hypothesis include studies into the following (among others) personality traits (Bleda, 1974), attitudes (Yeong Tan & Singh, 1995), ethnic backgrounds (Hu et al., 2008), voice features (Nass & Brave, 2005), and also facial features (Bailenson et al., 2008) with no conscious awareness of the assessors to the manipulation of similarity.

Thirdly, perceiving familiar faces evokes positive feelings and, on the contrary, unfamiliar ones provoke caution and fear (Cao, Han, Hirschleifer, & Zhang 2011) or even hostility. An unfamiliar object or organism (or a person with strange facial features) is a potential source of danger for an organism striving for survival, hence it becomes alert, cautious, and prepares for flight or fight as needed. Fear of the unknown and xenophobia are considered to be a fundamental fear (Carleton, 2016) and such a “setup” provokes mostly negative emotions. Through this mechanism, objects that are frequently encountered and do not represent a danger evoke more positive reactions, are preferred and considered to be more attractive than unfamiliar or unusual ones. And finally, the theory of cognitive averaging states that subjects organize and classify sensory information into categories (e.g., “chairs”, “dogs”, or “faces” etc.). Cognitive averaging of the individual examples within certain categories creates a central representative of the category – a “prototype”. An important consequence of prototype formation is that subjects find the prototype more attractive than any individual category member. The reason for is that the prototype (due to its familiarity) is easier (cognitively) to process (Pallet, Link, & Lee, 2010). Due to this cognitive averaging mechanism prototypes are often preferred to individual exemplars of the categories of stimuli (Whitfield & Slatter, 1979; Martindane & Moore, 1988) and for example a face that is familiar (resembles one’s own face) is perceived as more attractive than any individual face (Rubenstein, Kalakanis, & Langlois, 1999).

A number of studies have proved the effect of the theories mentioned that lead to mating with similar partners. Most of them tested the similarity of existing pairs after partnerships of various lengths. However, in many cases, the resemblance observed in the personality of couples did not change with the length of the partnership and – actually – some characteristics seemed to correlate better in couples who had lived together for a shorter period (Escorial & Martín-Buro, 2012). It has been found that the attractiveness of similarity also extends to non-romantic friendships (McPherson, Smith-Lovin, & Cook, 2001). It, therefore, seems that the similarity of personalities in couples is not the outcome of a shared life, but is the result of an active choice of partner carried out at the beginning of a relationship.

Research concerning the assessment of human faces shows that people are able to assess the characteristics of others from their faces. Many authors (see e.g., Borkenau & Liebler, 1992, 1993; Costa & McCrae, 1992; Goldberg, 1993; Penton-Voak, Pound, Little, & Perrett, 2006) have proved the predictive value of facial features for specific personality factors. More recently, most of this research has employed the Big Five personality traits (for a review, see Connolly, Kavanagh, & Viswesvaran, 2007) with the main emphasis on conscientiousness and extraversion. This body of evidence has also led to the creation of a variety of facial composites that represent specific personalities (e.g., Big Five traits – Penton-Voak, Pound, Little, & Perrett, 2006) or other (e.g. intelligence – Kleisner, Chvátalová, & Flegel, 2014) features. Further research also shows that the assessed degree of

attractiveness of the face may be based on attributed personality traits of the evaluated faces and that people tend to prefer and consider more attractive those faces that resemble their own personality traits. Little, Burt, and Perrett (2006) found that male faces, attributed with a higher degree of extraversion, are preferred by women who are also extraverted.

2 Objective

From the data mentioned above, we may ask the question, based on the preferred personality traits present in the evaluated faces, whether people tend to consider those faces that resemble their own characteristics to be more attractive. It is also questionable, whether this preference (if valid) applies generally (extends to a non-mating context), or it is only valid in the evaluation of potential sexual partners. To find an answer, as an example, we have chosen extraversion/introversion as a personality trait and intelligence.

3 Methods

The subjects (N=1,903) were Slovak men (N=754; 39.6%) and women (N=1149; 60.4%) between the ages of 15 and 67 (mean 23.96; st.dev. 9.128) who were asked to fill in a battery of tests. The intelligence score of each participant was measured using two subtests (measuring verbal and visuospatial IQ) from the standardized "Test of the Level of Mental Abilities" (Vonkomer, 1992) and the score of self-reported extraversion from the "Personality Inventory KUD" (Miglierini & Vonkomer, 1986).

For the assessment of the attractiveness of faces, eight computer-modified facial composites were used that represented high and low levels of intelligence and high and low levels of extraversion in both sexes. The technique of computer-modified facial composites is based on the process, where initially a large number of individuals complete the self-report extraversion/introversion questionnaire (or intelligence tests). Further, a smaller number of participants (e.g. 10%) who score the highest and the 10% who scored the lowest are selected as representative extraverted/introverted (or high/low intelligent) individuals. These representatives are photographed and to construct composites, hundreds (e.g., in case of extraversion/introversion there were 219) of standard feature points are marked as facial landmarks on each face. The mean coordinates of each delineated feature point are calculated to generate average shape information (Penton-Voak, Pound, Little, and Perrett, 2006). Information about the typical shape is applied to the facial average picture (an artificially created face computed from the many photographs) and a face typical of an extravert/introvert (or a person high/low in intelligence) is created.

Within the face assessment task, participants were asked (along with other tasks not listed here) to choose the most attractive face from a set of two nearly identical male and female faces. The participants were blind to the fact, that the two faces within each set differed in the specific features known to indicate different levels of intelligence (see Figure 1 – Kleisner, Charvatova, & Flegr 2014) and different levels of extraversion/introversion (see Figure 2 – Penton-Voak, Pound, Little, and Perrett, 2006). A statistical analysis was carried out using the SPSS program, version 16.

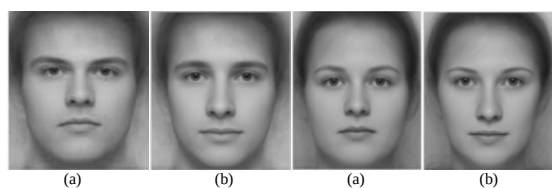


Figure 1. Face composites manipulated to show different levels of intelligence. Faces marked a) refer to faces indicating low intelligence, b) faces indicating high intelligence (Source:

Source: Kleisner, Charvatova, & Flegr 2014; <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0081237>)



Figure 2. Face composites manipulated for facial extraversion and introversion. Faces marked a) refer to faces indicating introversion, b) to faces indicating extraversion (Source: male faces: Penton-Voak, Pound, Little, & Perrett, 2006, p. 622; female faces: <http://www.bbc.co.uk/wales/radiowales/sites/science/cafe/updates/20111016.shtml> [cit. 2016-06-28])

4 Results

To answer the question of whether people tend to consider those faces, that resemble their own characteristics based on their preferred personality traits present in the evaluated faces to be more attractive, we measured the intelligence and extraversion of the participants and their attractiveness preferences for low/high intelligence male/female faces and extravert/introvert male/female faces. The intelligence and extraversion of the participants were measured and found to have a normal distribution (values for intelligence: mean=13.79; st. dev. 2.63; skewness=-.286; kurtosis=.160, values for extraversion: mean=10.85; st. dev.=3.59; skewness -.697; kurtosis=.051), therefore parametric tests were used in further computations.

Table 1
T-test for differences in intelligence between 2 groups according to the preference for low/high intelligence facial composites

Preferred male facial composite	N	Mean	St. dev.	T	Sig. (2-tailed)
Low intelligent	905	13.85	2.747	.877	.381
High intelligent	998	13.74	2.524		
Preferred female facial composite	N	Mean	St. dev.	T	Sig. (2-tailed)
Low intelligent	732	13.67	2.931	-1.581	.114
High intelligent	1171	13.87	2.425		

Table 1 shows there is no statistically significant difference in the intelligence level of the participants which preferred the face indicating low intelligence to those who considered the face indicating high intelligence to be more attractive, neither in the case of male facial composite nor female facial composites. It, therefore, seems that the intelligence level of the evaluator does not significantly influence the preference or assessed attractiveness of facial features typical of the presence of intelligence. Similarly (see table 2), we did not find a statistically significant difference in the self-reported extraversion levels of the participants which preferred the introverted facial composite to those who considered the extraverted facial composite to be more attractive, neither in the case of the male facial composite nor the female facial composite. It is likely that extraversion levels do not have an impact on the attractiveness ratings of faces having typical facial features of introversion or extraversion.

Identical conclusions can be drawn from the t-tests results computed separately for the analysis of the facial preferences of potential sexual partners (male choices for female facial composites and vice versa). Tables 3 and 4 do not show any significant differences in intelligence (Table 3) and extraversion

(Table 4) levels between the groups of participants which preferred low to high intelligence (introverted to extraverted) facial composites.

Table 2

T-test for differences in extraversion between 2 groups according to the preference for the introverted/ extraverted facial composites

Preferred male facial composite	N	Mean	St. dev.	T	Sig. (2-tailed)
Introverted	785	10.92	3.739	.621	.535
Extraverted	1118	10.81	3.477		
Preferred female facial composite	N	Mean	St. dev.	T	Sig. (2-tailed)
Introverted	454	10.81	3.676	-.327	.744
Extraverted	1449	10.87	3.560		

Table 3

T-test for differences in intelligence between 2 groups according to their preference for low/high intelligent facial composites in the split sample

Preferred male facial composite (female sample)	N	Mean	St. dev.	T	Sig. (2-tailed)
Low intelligence	500	13.67	2.675	.056	.955
High intelligence	649	13.66	2.519		
Preferred female facial composite (male sample)	N	Mean	St. dev.	T	Sig. (2-tailed)
Low intelligence	308	13.87	3.005	-.966	.334
High intelligence	446	14.06	2.450		

Table 4

T-test for differences in extraversion between 2 groups according to their preference for introverted/ extraverted facial composites in the split sample

Preferred male facial composite (female sample)	N	Mean	St. dev.	T	Sig. (2-tailed)
Introverted	450	11.02	3.518	1.097	.273
Extraverted	699	10.79	3.589		
Preferred female facial composite (male sample)	N	Mean	St. dev.	T	Sig. (2-tailed)
Introverted	206	10.81	3.702	-.045	.964
Extraverted	548	10.82	3.602		

From the results, we can assume that personal characteristics (specifically, the level of intelligence and extraversion) do not change attractiveness preferences for high/low intelligence of introverted/ extraverted facial composites when evaluating faces of the opposite sex.

5 Discussion

The presented study focused on attractiveness preferences for male and female faces differing in their levels of extraversion and intelligence. The objective was to reveal, whether subjects who prefer highly intelligent faces are also more intelligent compared to those who preferred faces possessing the facial features of lower intelligence. Similarly, we tested whether the subjects who preferred highly extraverted faces are also more extraverted compared to those who preferred faces possessing facial features indicating introversion. The findings of our study did not reveal a statistically significant difference in the levels of intelligence between the group of subjects who considered the highly intelligent facial composite to more attractive and the group of subjects who considered the facial composite with facial features typical for low intelligence faces to be more attractive. Also, there was no statistically significant difference

in the levels of extraversion between the group of subjects who considered extraverted faces more attractive and the group of subjects who considered introverted faces more attractive. As the attractiveness preference suggests inter-sexual dynamics, we also tested our objective on a sample of women (evaluating male faces) and men (evaluating female face) separately. Neither were there any statistical differences in the intelligence or extraversion levels in the groups of subjects that differed in their preference for intelligent and extraverted faces.

There might be various explanations for the absence of a similarity between the features of the observer and their tendency to prefer these features in the face of the composite evaluated in our research. Even though several studies have shown that people tend to mate with partners having similar in personality traits (Bleda, 1974), social attitudes (Yeong Tan & Singh, 1995), ethnic backgrounds (Hu et al., 2008), vocal features (Nass & Brave, 2005) or facial features (Bailenson, Iyengar, Yee, & Collins, 2008), these preferences have been seen in existing (and sometimes even long-lasting) couples. It is possible, that couples may adjust their characteristics in order to synchronize with their life partner or they tend to maintain a relationship with such a type of partner and split up with those who are too different. The similarity hypothesis in terms of personality/intelligence characteristics, therefore, might only be applicable after certain duration of "dating" and learning each other's character. We also assume that "at first sight" facial evaluation mainly concentrates on physical features that signal evolutionary important characteristics such as age, signs of good health, fertility, the potential for "good genes", features which give confidence in paternity (Bovet, Barthes, Durand, Raymond, & Alvergne, 2012) and therefore the preferred similarities shared by the evaluator and evaluated person can be tied primarily to such features.

Another group of explanations for the results achieved could come from the limitations of our study that might have interfered with our data. We did not take into account the sexual preferences of the evaluators. If we assume that attractiveness preferences are closely tied (mainly within "at first sight" attractiveness preferences) to the evaluation of potential sexual partners, it is possible, that subjects with a homosexual orientation would not evaluate the presented facial composites as expected. Also, we may discuss how age affects attractiveness choices. Those subjects in the fertile period of their lives may evaluate the faces of possible sexual partners in a different way to women who are post-menopausal. Similarly, if the evaluator is already engaged in a relationship (has a partner) or is actively searching for a partner could affect the way that faces of the opposite sex are evaluated in terms of their attractiveness. Several studies have proved (see e.g. Burriss, Welling, & Puts, 2011) that, for example, women looking for a short-term partner consider different male facial features attractive than when they are searching for a long-term one. Differences in attractiveness preferences also depend on more delicate factors, such as the menstrual cycle (Little & Jones, 2012). All these considerations may be useful topics for further research with the potential to verify results of this study as well as to clarify the specifics of the proposed objectives.

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