THE RELATION OF PERSONAL CHARACTERISTICS AND BRAIN DIMORPHISM OF WOMEN TO MASCULINE/FEMININE MEN FACE PREFERENCE

[a]LENKA SELECKÁ, [b]SLÁVKA DÉMUTHOVÁ

University of Ss. Cyril and Methodius in Trnava, Námestie J. Herdu 2, 917 01 Trnava, Slovaka
email: [a]lenka.selecka@ucm.sk, [b]slavka.demuthova@ucm.sk

Abstract: The possible connection among women personality traits, their masculinity (measured by the ratio 2D:4D), and preference of masculine/feminine male's face image is explored on the research sample of 288 women (M=21.23y, SD=6.135). Personality Inventory KUD has been used to assess their personality traits: dominance/submissiveness, rationality/sensuality, and extraversion/introversion. Results have shown that there is a connection among the personality traits, 2D:4D and preference of men's face. More masculine women prefer masculine male face. The more feminine is a female, the more are her personality traits accentuated, the less straightforward is her preference of the man's face type. Women who are neither feminine nor masculine prefer feminine male face.

Keywords: Face attractiveness, Personality traits, Masculinity, 2D:4D, Female choice.

1 Introduction

The face plays a crucial role in social cognition and behavior, therefore an answer to the question what women prefer while making a decision about attractive men faces has come to the center of attention in several researches. An interconnection between certain personal characteristics and facial traits can be found, since stable personality traits have the potential to be reflected in specific facial traits. For example, faces high in symmetry which are primarily received as more attractive, and healthy, are as well perceived as having positive personality attributes. It could be assumed, that women make their choices by estimation of men's personal characteristics, which might be based on the image of physical beauty.

The process behind attractiveness evaluation has been proven to have biochemical base, as is known, watching a beautiful face activates brain reward centers[1] [2], and through the mechanism of reward centers enhancement, attractive faces could motivate sexual behavior, and the establishment of friendships/same-sex alliances.[3] In general, attractive people are seen in a positive light for a wide range of attributes compared to unattractive people. This sort of stable perception associated with physical attractiveness has been described as "what is beautiful is good" stereotype.[4] Similarly, as was confirmed in a meta-analytical study[5] people describe individuals with beautiful faces along positive lines.

Attractiveness of a face depends on certain components as averageness[6], symmetry[7] [8], sexual dimorphism[9], skin quality[10], a

pleasant expression, good grooming[11], youthfulness[12], and, for known faces, attractiveness can reflect nonphysical characteristics, such as how much one likes the person.[13] The most sexually selected preferences on a face are[14]: 1. preference for proximity to a spatially average face, i.e. averageness; 2. preference for bilateral symmetry, and 3. preference for feminine traits in female faces and masculine traits in male faces. From psychological point of view, an important cross-cultural confirmed conclusion suggests that personality traits are (by both sexes) reported as to be one of the most important factors in partner choice[15] [16]. Therefore, personality attributions elicited by a face could impact on its attractiveness, thus, it may be that the personality attributions are driving the attractiveness judgments.[17] Based on the fact that women find as desirable what they consider good, and they perceive faces with desired traits attractive, it has been hypothesized that facial attractiveness reflects ''what is good is beautiful'' reversing the causal logic of ''what is beautiful is good''.[18] Moreover, regardless of the potential inaccuracy of personality attributions, many individuals do believe the face is an important source of information about one's character.[19] People differ in their preferences for personality in partners, therefore personality inferences about a face may influence that face's attractiveness.[20]

This paper is oriented on masculinity/femininity understood as one of the universally attractive traits.[21] The attractiveness evaluation of a female face towards femininity is rather straightforward, the more is a woman's face feminine the more attractive she is considered.[22] [23] On the other hand the preference for masculine/feminine male face is not as straightforward as expected. Although some studies have confirmed that there is a clear preference for more masculine male faces[24], other research has shown some exceptions where feminized male faces were found more attractive.[25] [26] Additionally, facial masculinity can be assessed by women as possessing higher social status rather than physical attraction.[27] More masculine men are considered

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healthier[28], and at the same time these men are characteristic by negatively perceived personality traits as lower honesty and lower warmth.[29] Very attractive male faces possess a combination of both masculine and feminine features, and therefore reflect 'multiple motives' in a woman's choice of partner, i.e. the desire for a dominant and a cooperative partner.[30]

Several researches have explored the cyclic shifts in women's attraction to masculine traits in a men's during the menstrual cycle[31] [32], and it was suggested, that women are more interested in "good genes" in the fertile phase, and more interested in social advantages (e.g. a cooperative partner) when they are in the luteal phase of the menstrual cycle. Further, some studies have found a connection between the evaluation of male face and situational factors as is the presence of a stable relationship, pursuing a long-term or a short-term relationship[33], or usage of oral contraception.[34] However, as far as we know, an empirical arena devoted to attractiveness research did not bring almost any findings exceeding the question of mutual interaction among women personality traits, their masculinity (measured by the ratio 2D:4D), and preference of masculine/feminine male's face image. This research is focused on the question how stable characteristics of women shape the process of male's face attractiveness evaluation.

2 Method

The participants filled out a battery of questionnaires and performance tasks among which they had to evaluate the attractiveness of a male face according to his masculinity / femininity. To explore our research question these variables have been processed:

Sex - Participants were asked to choose from two categories of sex. This research analyses only women.

Attractiveness of masculinity/femininity of faces - The face composites[35] were used for face attractiveness assessment based on masculinity/femininity perception. Two male composites manipulated in facial masculinity and femininity in compliance with face features corresponding with high masculinity and femininity in faces have been used. Women, who evaluated the faces according to their attractiveness were blind to the fact that faces represent two different levels of masculinity/femininity. Women were asked to answer the question: "Which face do you like more?" The task was to choose from two possibilities: a face with masculine traits or a face with feminine traits. Face composites are shown at the figure 1.
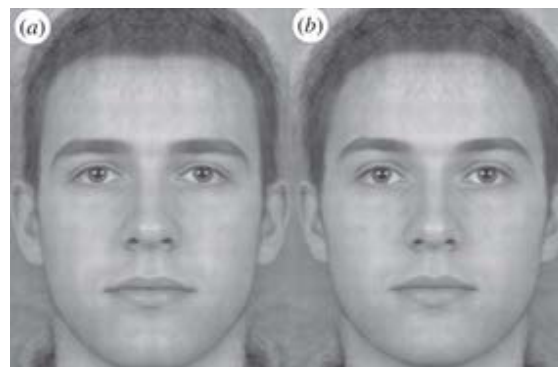

Figure 1: Face composites manipulated in facial masculinity and femininity. Face marked a) refers to masculinized face, b) refers to feminized face[36]

Personality traits - Personality Inventory KUD was used for quick assessment of personality traits which could be presumably related to a face preference. These personality traits are included: dominance/submissiveness, rationality/sensuality, and extroversion/introversion. Each trait is represented by 8 items, with these possible answers: agree/disagree/neither. Sample items: "I'm calm even if I decide about something that I really care about", "Generally, I act upon a predetermined schedule".

Brain dimorphism - 2D:4D represents the length of the second finger divided by the length of the fourth finger. This ratio substitutes for the measurement of the amount of prenatal androgens exposure.[37] The high prenatal levels of androgens refer to low values of 2D:4D and therefore to a more masculine brain development and high values of 2D:4D refer to a more feminine brain development. In general, the 2D:4D ratio represents the amount of masculinization of the brain, it allows to measure the amount of masculinity/femininity of a person on a scale. These values enables to assign the subject into the right value of brain masculinization regardless the visible biological sex (male vs. female).[38] 2D:4D has been measured as the length from the midpoint of bottom crease to the tip of the fingers on both hands.

Research sample consists of 288 women. The mean age is 21.23 years (SD=6.135). The average value of 2D:4D measured on the right hand has gained 0.995 (SD=0.041) and the average value gained on the left hand is 0.997 (SD=0.046). Any participant engaged in the research after oral consent.

3 Results

In order to examine the possible typology of women linking the decision about the attractiveness of male faces and women personality traits and their 2D:4D ratio, cluster analysis has been executed. Non-hierarchical cluster analysis (two step cluster analysis) was used due to the fact that a categorical variable (masculine/feminine male face preference) as well as continuous variables (personality traits: dominance/submissiveness, rationality/sensuality, and extraversion/introversion, and 2D:4D ratio) has been used in the analysis.

The results have shown that there is a connection among the personality traits, 2D:4D and preference of man's face. The cluster analysis has manifested three main clusters (Table 1). The first cluster is characteristic by the most frequent category inside the cluster which is the masculine male face, represented

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by 117 participants (99.1% of the same choice in one category). These women manifest the lowest values of 2D:4D, thus having a more masculine brain than other groups. The second cluster has manifested both possible choices of preference, slightly more frequented category inside the cluster is the preference of masculine male face (58.3%). This group is the most feminine group among all three clusters ($M_{Left2D:4D}$=1.02 and $M_{Right2D:4D}$=1.02). As may be visible, the more feminine is a female, and the more are her personality traits accentuated, the less straightforward is her preference of the man's face type. The third cluster consists of 120 women. According to 2D:4D ratio, this cluster in the middle of the three groups, in comparison to the other groups it could be said that women who are neither feminine nor masculine prefer feminine male face.

Table 1. Cluster analysis results: Clusters of female personality traits, the 2D:4D ratio, and preferences of the male faces

	Cluster 1	Cluster 2	Cluster 3
Size	117 (42.9%)	36 (13.2%)	120 (44.0%)
Male face preference	Masculine male face (99.1%)	Masculine/Feminine male face (58.3%/41.7%)	Feminine male face preference (100.0%)
Introversion	4.40	13.42	4.32
Dominance	7.80	13.72	8.37
Sensuality	6.52	12.86	7.88
Rationality	9.57	13.03	8.84
Right 2D:4D	0.99	1.02	1.00
Submissiveness	10.33	12.06	10.55
Left 2D:4D	0.99	1.02	1.00
Extraversion	11.19	12.50	11.78

We have analyzed the variance of the personality traits, and 2D:4D ratio of women according to the three clusters (Table 2) in order to examine further the potential differences among groups of females in compliance with those preferences. In concordance with cluster analysis results, all constructs have manifested as significant in the differences among groups of women with the exception of extraversion, which appears as the least important personality trait in the cluster analysis as well.

Table 2. One way analysis of variance results: Comparison of clusters of female in personality traits and the 2D:4D ratio

	Cluster	N	M	F	p
Dominance	1	117	7.80	45.762	.000
	2	36	13.72		
	3	120	8.37		
Submissiveness	1	117	10.33	4.331	.014
	2	36	12.06		
	3	120	10.55		
Sensuality	1	117	6.52	41.980	.000
	2	36	12.86		
	3	120	7.88		
Rationality	1	117	9.57	21.462	.000
	2	36	13.03		
	3	120	8.84		
Extraversion	1	117	11.19	2.597	.076
	2	36	12.50		
	3	120	11.78		
Introversion	1	117	4.40	104.085	.000
	2	36	13.42		
	3	120	4.32		
Right 2D:4D	1	117	0.99	7.518	.001
	2	36	1.02		
	3	120	1.00		
Left 2D:4D	1	117	0.99	4.318	.014
	2	36	1.02		
	3	120	1.00		

4 Discussion

In general, according to multiple motives model of male attractiveness, prevalent male face preference is a face with the presumed features of sexual maturity, dominance, sociability, approachability, and high social status.[39] Since the motives of desired partner's personality can be combined, the relationship between attractiveness and presumed male's dominance may be somewhat unclear, some authors find mentioned relationship[40] [41],

and others don't.[42] As was found out in the current study, the situation mirrors presumed multiple motives model since masculine male face is preferred only slightly more (50.3%) than feminine male face (49.3%). The presence of differences among women in their preference of masculinity shows us that women don't generally have an identical idea of an attractive man. This finding leads to an assumption that there might be factors influencing the process of evaluation apart from general manifestation of a beautiful face.

One from the contemplated factors influencing the face's image attractiveness might be personality attributions elicited by a face[43], personality of the potential partner is more important in the process of making a choice to women than men.[44] Simultaneously, desired personality is important in terms of real mate choice and people prefer partners with similar personalities.[45] If the evaluation of men faces attractiveness is based on the presumed personality of men, and women tend to prefer partners with similar personalities, it might be important to examine if the personality traits of women can influence this attractiveness evaluation of men faces. Surprisingly, very little research has investigated whether personality traits of women has a relationship with the evaluation of men faces attractiveness based on their presumed personality. Our results have provided evidence that not only desired personality influences perceptions of facial attractiveness in male faces[46], but in addition, that women differ in the decision about the attractiveness of male faces depending on their own personality traits, thus, personality traits of women play a role in face attractiveness evaluation based on presumed personality trait of the evaluated face.

Individuals are choosing partners who physically resemble themselves or partners who appear to have similar personalities to themselves.[47] The evidence for this assumption is not very clear as it is possible, that established couples aren't similar looking, they rather become more physically alike over time due to sharing similar diets, lifestyles and emotional experiences.[48] On the other hand, the most straightforward evidence for assumption of resemblance searching in potential partners in our research is the relationship between presumed masculinity from a man's face image and the enhanced (in comparison to other groups) masculinity of the judges. As the women are characteristic by lower values of 2D:4D, which suggests a more masculine brain development. It might be that the evaluation of a masculine male's face attractiveness is conducted in compliance with own masculinity of the females just because there is a possibility of personalities resemblances. A research supporting the importance of personality traits between partners provided evidence that partners tend to mate assortative for agreeableness, conscientiousness and openness to experience.[49] The preferences for similar personalities may be reflected in face preferences. The fact, that personality is assumed from faces is documented[50], these assumptions may not be accurate, but the desire for a partner with similar personality traits has the potential to affect attractiveness evaluation. As it seems, the preference for a partner based on

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similar personality traits could lead to facial similarity in partners in terms of apparent personality.[51]

An interesting result has been provided on the other side of fingers length difference. The most feminine women are characteristic by accentuated personality traits more than by a specific face preference. This group of women don't judge any face prevailingly more than the other type of male face. Slightly more frequented category is a masculine male face, but it isn't a straightforward preference. The group of women is rather typical by higher introversion, dominance, submissiveness, rationality and sensuality. It can be assumed, the more a female's personality traits are accentuated, the less straightforward is her preference of the man's face type. The last cluster stands according to 2D:4D ratio in the middle of the three groups. When comparing this women to the other groups it could be said that women who are neither feminine nor masculine prefer feminine male faces. Since, we have found out that masculinity in women is attracted to masculinity in male's face, we can assume that women who are not as much masculine may prefer less masculine men.

Women's assumption that faces provide important guides to personality[52] may lead them to make partner choices based on facial appearances that appear to be in line with desired personality traits of the partner or own personality traits or the 2D:4D ratio. Further research is needed as the results are rather multifaceted.

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