THE PERCEIVED ATTRACTIVENESS OF SEXUAL DIMORPHIC FEATURES IN MALE FACES ACROSS THE LIFESPAN OF A WOMAN

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Abstract: According to evolutionary psychology, the presence of masculine sexual dimorphic traits is an indicator of the hidden qualities of the organism. On the other hand, it is also characteristic of men with low levels of warmth, honesty, and a reluctance to invest in offspring. As female reproductive goals vary across a woman's lifespan, changing from finding the best donor of "good genes" to a commitment to a "selfless caregiver", it is probable that the attractiveness of masculine/feminine facial features in male faces changes across a lifespan. The results of the study indicate that the degree of preference for masculine male faces increases from their teens, reaches a maximum during the period of reproduction before marriage and decreases in older age, with a statistically significant decrease in the postmenopausal period.

Keywords: Attractiveness, male face, sexually dimorphic features, age.

1 Introduction

The attractiveness of another person is a multidimensional and complex phenomenon that is comprised of numerous social (Ha et al. 2010), cultural (Voegeli et al. 2021), ontogenetic (Salehi et al. 2019), gender (Palumbo et al. 2017), and other variables. In its essence, the phenomenon of human attractiveness is linked to biological mechanisms (the activation of the reward systems in the brain, including the amygdala, insula, and limbic system – Pitcher et al. 2011) and stems from evolutionary pressures, through which our psyche has been shaped over hundreds of thousands of years. A whole complex of changes (the activation of reward centres in the brain, the presence of positive emotions, the tendency to prefer one individual over another based on visible characteristics etc.) covered by the umbrella term attractiveness occurs in an individual as a reaction to the presence of specific, visible features of another person. This preference in the appearance of another person is the result of evolution (Demuthova et al. 2019) – such links have formed because these characteristics turned out to be markers of the hidden qualities of the other person which allowed them to better secure their survival – whether by gaining access to food resources (natural selection) or the successful reproduction of their genes through their offspring (sexual selection). These visible characteristics include, for example, a narrow waist and wide hips in women (the WHR ratio, which highly correlates with a woman's fertility), larger jawbones, thinner lips and cheeks in men (features of masculinity, which correlate with high levels of testosterone – Penton Voak & Chen 2004) or facial symmetry (as a signal of developmental stability – Simmons et al. 2011).

Every feature/characteristic, which is considered to be attractive, has its traces linked to a hidden quality that provides evolutionary advantages. Humankind "learned" to identify these advantages through external features and their preference is reinforced by the activation of the reward centres and is accompanied by a positive experience for the observer (the feeling of attractiveness). It is a matter of discussion whether the evolutionary mechanisms of the preference for a partner that are accompanied by an experience of attractiveness are still important today, when our survival and number of children no longer depend on the fitness of the individual. It is true that stronger phenomena have appeared in the post-industrial society, including the compatibility of values and interests, trust, providing support, mutual understanding, faithfulness, responsiveness... (Canevello & Crocker 2010; Laborde et al. 2014; Lopes et al. 2017), which have a dominant impact on who we prefer in a romantic relationship; however, it should be noted that we are still influenced by evolutionary mechanisms of preference. They are particularly strong in the initial phase of interpersonal interactions, when a primary "filtering" stage occurs – we filter out those whom we like and whom we find attractive, and thus if we are willing to interact or not. The human face appears to be especially important in this context, since (as opposed to the body) it is uncovered and therefore it allows us to read the important features/signals more quickly and more accurately.

Many studies highlight that we are still highly sensitive to specific features (signals), and we consider faces with these features to be attractive – without even realising these features are present and that we have a preference for them. In this regard, several features are considered to be attractive, for example, symmetry, averageness or neoteny (Rhodes et al. 2001; Little et al. 2011a; Kočnar et al. 2019). Another major feature is the presence of sexually dimorphic features (Foo et al. 2017; Mogilski & Welling 2018). Feminine features such as high eyebrows, gracile jaws and fuller lips, a smaller lower part of the face and a relatively flat mid-face (Penton-Voak & Perrett 2000; Little et al. 2011a) indicate the health and fertility of a woman to men (Gray & Boothroyd 2012; Little et al. 2014); masculine features such as wide faces with large and massive lower faces, thinner cheeks and lips, a wide inter-orbital distance and a wide nose (Mitteroecker et al. 2015; Little et al. 2011a) correlate with a high level of testosterone which is crucial for spermatogenesis (Foo et al. 2017).

2 Problem

While men's preference for feminine faces is relatively stable and universal (O'Connor et al. 2013; Little et al. 2014; Demuth & Demuthova 2017), female preferences for masculine features in a male face have been associated with diverse results. Some studies have confirmed a high degree of preference for masculine features (Rennels et al. 2008), while others have confirmed a preference for feminine (Burriss et al. 2014) features in a male face. There are also results that state that facial dimorphism has no significant influence on any of the measurements of attractiveness (Muñoz-Reyes et al. 2015). However, more detailed analyses have shown that the different results in the preference for masculine and feminine features in male faces may depend on the presence of other factors that modify these preferences. These include mate selection strategies of women (Holzleitner & Perrett 2017; Ekrami et al. 2021), hormonal activity during the menstrual cycle (Peters et al. 2009), the type of relationship that the woman wishes to enter (Soler et al. 2012), their financial situation (Marcinkowska et al. 2019) and others.

In the context of evolutionary impacts, the age and ontogenetic phase of a woman's life appears to be important. It may be assumed that during the period of fertility (the phase of life when a woman is planning to reproduce) a woman will look for partners with the genes that give the best chance for the survival of her offspring – she will focus on dominant, ambitious and aggressive men who are characterised by high levels of testosterone and thus have masculine facial features (Little et al. 2015). Dominance (Ahmetoglu & Swami 2012) or aggressiveness (Little et al. 2015) equals better success in gaining resources and a higher social and economic status (Gouda-Vossos et al. 2019). However, a high level of masculinity results in low levels of warmth and honesty (Fink & Penton-Voak 2002), which are not advantageous characteristics for a long-term partner that will take care of offspring. There is also evidence that males with masculine features are relatively less likely to invest in offspring (Penton-Voak et al. 2003). The above-mentioned data gives us reason to believe that a woman in the phases of mate selection and the period of upbringing will, on the contrary, tend to prefer individuals with a high degree of feminine features and consider them to be more attractive. These features are connected to characteristics such as warmth, faithfulness, willingness to help, etc. that are valued in a long-term relationship (Gangestad et al. 2007). In the light of the above assumption, we expect that female preferences for

masculine and feminine features in the assessment of the attractiveness of a male face will differ in the individual phases of life bound to reproductive functions.

3 Objective

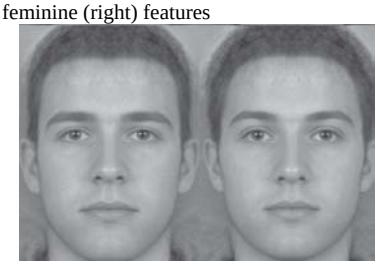
The main objective of the paper is to explore the attractiveness of masculine features in male faces by women in various periods of their lives over their lifespan.

4 Method

4.1 The Presence of Sexual Dimorphic Features

For the study of the attractiveness of sexual dimorphic features present in a male face we used a computerised facial composite with two different versions – one with a high level of feminine facial features (Figure 1A) and one with a high level of masculine (Figure 1b) facial features. The advantage of working with digital facial composites is that a computer-generated male face (which does not belong to any specific person) can be digitally modified to exhibit specific desired characteristics. Studying facial attractiveness is therefore conducted as a kind of experiment – the subject is exposed to two identical impulses (elimination of undesirable variables) that only differ in terms of the presence of masculine/feminine features (independent variable). If the subject evaluates one of the faces to be more attractive (dependent variable), it shows that the preference is exclusively caused by the presence of specific facial features (feminised or masculinised face). The impact of other characteristics that might be present in natural (real) faces and might therefore influence the individual assessment of attractiveness is thus controlled (eliminated).

Figure 1. Male facial composite with a prevalence of masculine (left) and feminine (right) features



Source: Little et al. (2011a, 1642).

4.2 Developmental Periods

Given the assumption that a preference for masculinity is linked to the reproductive behaviour of a woman, six periods of life were specified:

1. The pre-coital period (≤16 years old). According to Slovak statistics (Markova et al. 2019) the mean age of the first experience of sexual intercourse is at 17 years of age. For this reason, the first period ended at the age of 17, in which case we assume that the majority of the sample has not yet experienced sexual activity.
2. The exploration period (17 – 24 years of age). After the start of a sexually active life, most young adults go through an orientation phase, in which they not only explore their own sexuality but also form an idea about their desired future life partner through relationships with people of the opposite sex. The beginning of this period is set at the beginning of a sexually active life (at 17 years old) and it ends at the age when non-binding exploration changes to the phase of searching for an intimate partner (24 – 25 years of age).
3. The period of searching for a mating partner (25 – 30 years of age). During this period, women focus on relationships that potentially present mating relationships. We assume that this period may begin at approximately the age of 25 and the upper limit is set at the mean age for the marriage of women (31 years old – Podmanicka 2019).
4. The period of marriage (31 – 40 years of age). During this period women create and try to maintain the long-term relationships in marriage (or as a family). On one hand, most women give birth during this period and on the other, they tend to make and keep the relationship with the partner who helps them to raise the offspring.
5. The period of childcare (40 – 50 years of age) is a period of ontogenesis, during which women are still fertile from a biological perspective, but most women focus on raising children and ensuring the success of their children rather than on procreation.
6. The postmenopausal period (≥ 51 years of age). Menopause (which starts in Slovak women at a mean age of 51 – Kristalyova 2020) means the end of female fertility, after which a woman cannot conceive a child through natural means.

4.3 Subjects

The data was obtained from 1,293 Slovak female subjects aged 11 to 77 (mean age = 24.14; std. dev. = 10.591). The numbers of subjects in the individual age groups are presented in Tab. 1.

Tab. 1. Age specificities of the subjects according to the periods of life

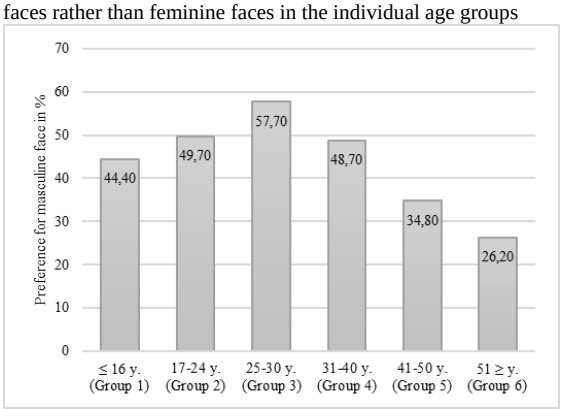
Group	1	2	3	4	5	6
age	(≤ 16)	(17–24)	(25–30)	(31–40)	(41–50)	(≥ 51)
N	9	998	78	78	69	61
Mean	13.22	19.54	27.15	35.36	45.46	52.87
Std. Dev.	1.986	1.675	1.802	2.963	3.061	6.857
Minimum	11	17	25	31	41	51
Maximum	16	24	30	40	50	77

Source: Author.

5 Results

The results (Figure 2) show that the preference for masculine features in male faces increases from the teenage years and reaches a peak at the age of 25 – 30, when the majority of women searches for an intimate partner, yet without a commitment (marriage) so far. It is during this period that masculine male faces are considered to be the most attractive – they were preferred by the majority (57.7%) of subjects of this age (as opposed to feminine faces). Then the preference for masculine features decreases (to 48.7% for the 31 – 40 age group and further to 34.80% for the 41 – 50 age group). After menopause, most women (73.80%) consider feminine male faces to be the most attractive.

Figure 2. Percentage of women that preferred masculine male faces rather than feminine faces in the individual age groups



Source: Author.

Given the high number of comparisons and the effort to eliminate type 1 errors, an ANOVA was used to compare the preference for masculine faces among five age groups. The output values of the analysis (F = 4.155; sig. <,001) indicated that women significantly differ in their preference for masculine male faces depending on their ontogenetic period. Subsequently, a Post Hoc Test for multiple comparisons of facial composite preferences among individual groups of women showed (see

Tab. 2) that statistically significant differences are present in postmenopausal women (group 6) compared to women aged 17-24 years (group 2) and to women aged 25-30 years (group 3).

Tab. 2. Multiple Comparisons of age groups in the preference for masculine facial features (Post Hoc Test)

				95% Confidence Interval	
Sample A – Sample B	Mean Diff. (A-B)	Std. Error	Sig.	Lower Bound	Upper Bound
1 – 2	.053	.176	1.000	-.59	.69
1 – 3	.132	.184	.975	-.51	.78
1 – 4	.043	.185	1.000	-.60	.69
1 – 5	-.097	.185	.994	-.74	.55
1 – 6	-.182	.185	.912	-.83	.46
2 – 3	.080	.058	.747	-.09	.25
2 – 4	-.010	.059	1.000	-.18	.16
2 – 5	-.149	.060	.139	-.32	.03
2 – 6	-.235	.059	**.002****	-.41	-.06
3 – 4	-.090	.080	.872	-.32	.14
3 – 5	-.229	.081	.057	-.46	.00
3 – 6	-.315	.080	**.002****	-.55	-.08
4 – 5	-.139	.081	.522	-.37	.09
4 – 6	-.225	.080	.064	-.46	.01
5 – 6	-.086	.081	.898	-.32	.15

Note: **p ≤.01
Source: Author.

6 Discussion

6.1 Interpretation of Results

The results obtained should be interpreted in the context of the various reproductive strategies adopted by women. They are based on the assumption that women must invest significant effort into pregnancy, childbirth, lactation and upbringing (as opposed to men who only have to contribute sperm for successful reproduction). In order to maximise reproductive success (with the production of the highest possible number of children), men use as many opportunities as possible (Cornwell et al. 2006), while women have to face the decision of which reproductive strategy to use. On one hand, it is advantageous for them to choose genetically apt, masculine partners, who donate "good genes", but they tend to be less willing to make an investment in parenting, in commitments and are more promiscuous. On the other hand, feminine men tend to be more willing to make long-term commitments and take care of the family, but have lower-quality genes.

Clearly, many factors have an impact on the choice of female strategy for mate selection – starting from the menstrual cycle phase (Gildersleeve et al. 2014), the length of the planned relationship (Little et al. 2011b), their own attractiveness (Cornwell et al. 2006), up to the decision to have or not have children (Watkins 2012). In spite of the possible interference of these variables, the assumption that women use the strategy of the selection of a donor of good genes in the fertile phases of life and prefer a caring partner during the periods of their life when they form long-term relationships has been confirmed. From all of the age groups, the highest level of perceived attractiveness of masculine facial features was present in the 25 – 30 followed by the group of 17 – 24 years old females. These are age periods during which women are biologically best prepared for reproduction, and therefore, it can be assumed that evolutionarily conditioned tendencies to prefer partners with good genes and fitness (and thus with masculine facial features - Prokosch et al. 2005) will be highest. By selecting an appropriate partner, the mother increases the probability that her offspring will survive and preserves her genes by ensuring her children possess successful, good genes.

Although reproduction continues after this period, the strategy of seeking a "caring partner & a good father" becomes more dominant, as shared parenting becomes very important during this time. From statistics, it can be inferred (see the Statistical Yearbook of the Slovak Republic 2022) that the highest number of women give birth to their children at the age of 30-34 years, which explains the decrease in interest in masculine faces during this period. Instead, a preference for feminine male faces reflecting characteristics such as warmth, faithfulness, willingness to help (Gangestad et al. 2007), and higher investments in offspring (Penton-Voak et al. 2003) emerges. The female preference for masculine features rapidly decreases with fertility decline. The lowest level was found in women at an age of 51 and above, with the decrease being reflected in the statistically significant difference in the preferences for masculine features in this group as opposed to the younger age groups (17 – 24 and 25 – 30). Similar results were also found by Vukovic et al. (2009) – they discovered that the preference for digitally masculinised male faces decreases as a result of hormonal level changes in women aged 40 to 64. Once women reach menopause, they not only experience a reduction in fertility, but also in their sexual desire (Bancroft 2002), which is why they prefer long-term rather than short-term relationships (and prefer feminine partners). Since women are infertile after menopause, their sexual activity has no impact on reproductive success. This means that natural selection no longer creates any pressure on their preferences related to the selection of a partner (Kościński 2011). However, women after menopause may benefit from friendship with a man who is willing to take care of them and their children, which may explain a preference for feminine features in male faces that signal desirable characteristics in a man (e.g., faithfulness, caring nature, empathy).

6.2 Limits and Suggestions for Further Research

The first problem that occurred in the processing of the data was the disproportionate representation of participants in the individual age groups. After the individual groups were formed based on life periods, the first age group (up to 17 years of age) only included 10 women, while the second group (17 – 24 years of age) consisted of 964 participants. The numbers were relatively well balanced in the remaining groups (around 60 participants). To improve the validity of the results, it could be beneficial to collect additional data for the age groups with a smaller number of participants. Research dealing with preferences for sexually dimorphic facial features demonstrates that when selecting one of two strategies (the "donor of good genes" vs "caring father and partner"), several factors play a part – these include, as already mentioned, the ideal length of relationship (Little et al. 2011b), the phase of the menstrual cycle (Gangestad et al. 2007; Gildersleeve et al. 2014), the decision to have children (Watkins 2012) and others. Further research could therefore include these parameters.

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Primary Paper Section: A

Secondary Paper Section: AN