

Effects of Facial Symmetry on Physical Attractiveness

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Abstract

The relationship between facial symmetry and perceived levels of physical attractiveness was explored in this study. Seventy-two participants were asked to rate the facial attractiveness of 35 black and white photographs with varying degrees of symmetry. Facial symmetry was computed using ten facial locations. The results showed that although there was no significant relationship between general facial symmetry and perceived attractiveness, there was a significant relationship between facial symmetry determined in the area of the jaw and facial attractiveness. The significance and implications of the findings were discussed.

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The nature of human attraction has always been an enigmatic topic of research. It seems that, though everyone is attracted to different traits in a mate, there are some universal aspects of attraction that everyone shares. The perception of attractiveness in certain celebrities, for example, appears consistent between observers, regardless of age or cultural background. Why is that? What is it that makes a face look beautiful? Recent research has shown that people seem to have similar ideas about what constitutes an attractive face.

Beauty is experienced through visual stimuli. While there are some variations, the human face is generally symmetrical in design. From an evolutionary prospective, facial asymmetry is linked to a variety of physiological and psychological abnormalities; whereas facial symmetry serves as an indicator of general health and well-being (Shackelford & Larsen, 1997). As such, it has been argued that humans and other species are evolutionary innate to become drawn to facial symmetry by perceiving such features as 'beautiful'.

Several studies have been conducted to try and determine a positive correlation between facial symmetry and rating of attractiveness (Baudouin & Tiberghien, 2004; Grammer & Thornhill, 1994; Jones et al., 2001; Rhodes et al., 2001). Since 1992, Thornhill has studied physical attractiveness and its link to facial symmetry. In his studies, involving a total of more than one thousand students who were asked to rate photos of faces with varying degrees of symmetry, Thornhill was able to demonstrate an overwhelming preference for symmetrical faces (Gangestad & Thornhill, 1997).

Furthermore, Gangestad and Thornhill (1997) revealed an increase in extra pair copulations in males expressing heightened facial symmetry and masculinity.

Based on this previous research, the current study was designed to replicate Thornhill's study. It was hypothesized that facial symmetry has a positive effect on facial attractiveness. Supplementary to this main purpose, the present study was conducted to explore gender differences in ratings on physical attractiveness.

Method

Participants

The participants in this study consisted of California State University Northridge students enrolled in lower division introductory psychology courses. Participants' demographics consisted of 33.1% Hispanic, 22.2% White, 12.5% Asian American, 9.7% African American, and 22.5% identified as "other". From the total of 72 participants, 70 identified themselves as heterosexuals, and two identified themselves as bisexuals. Participants were between the ages of 18 and 29, with a large majority being 21 or younger ($M = 20.23$, $SD = 1.17$). There were 35 males and 37 female participants.

Materials

The facial photos used in the experiment were taken on Kodak Power Flash 800 disposable cameras. The photographs included both males and females from varying ethnicities, between the ages of 18 and 28, in the Southern California area. The photos were taken from a two and a half feet distant. Models, which consisted of ordinary people agreeing to have their picture taken, were instructed to stand in front of a white background, pull their hair behind their ears, and retain a neutral facial expression. In addition, a restriction was placed on the amount of make-up female models were

permitted to wear. Each of the 35 photos were then turned black and white using Photoshop and were put into a Microsoft Power Point presentation to be shown to the participants on a large screen.

In order to determine the facial symmetry of each of the photographs, Photoshop was used to run a straight diagonal line down the center of the nose, dividing the face into two halves. A second line was horizontally drawn in the area just below the lips. Nine other computer generated lines were drawn on each side of the face for a total of 20 lines. Each line was measured using the same ruler and its measurement was compared to the measurement of its corresponding line. Facial symmetry for each photo was ascertained by calculating the proportion between these 10 different pairs of lines (labeled A to J; see Appendix A).

A questionnaire consisting of two segments was designed and employed in this study. The first section contained a horizontal seven point Likert scale for each of the photos (Very Unattractive = 1, Unattractive = 2, Slightly Attractive = 3, Moderately Attractive = 4, Fairly Attractive = 5, Attractive = 6, Very Attractive = 7). Higher scores indicated higher levels of perceived attractiveness. The second section contained demographic information, including age, ethnicity, and sexual orientation.

Procedure

Participants were provided with a packet that included both sections of the questionnaire and asked to sit where they could clearly view the screen. An experimenter sat in the front of the room and instructed the participants to rate each of the 35 photographs using the Likert scale they were given. To assure they understood the instructions, participants were asked to rate two example photographs before rating

the actual photographs. The PowerPoint presentation that contained the photographs was shown on a large screen and participants had 20 seconds to rate each of the facial photographs. Once finished, the experimenter collected the questionnaires and read the debriefing form directly from off the screen.

Results

Overall mean symmetry values were obtained by averaging the ten proportion points for each photo, as described in the method section of this paper. Mean attractiveness ratings were also obtained for each of the 35 photos. A Pearson Correlation was computed to determine the relationship between these two variables (facial symmetry and ratings of attractiveness). The results showed that there was no significant relationship between facial symmetry and rating of perceived attractiveness, $r(33) = .08, p > .05$.

A detailed breakdown of the 10 facial proportion areas used in the computation of symmetry are presented in Table 1. A Pearson Correlation was used to determine the relationship between each of these symmetry points and ratings of attractiveness. The results showed that there was a significant relationship between symmetry determined by area F, the jaw line dividing the center of the face into two halves, and perceived levels of facial attractiveness, $r = .36, p < .05$. Increased symmetry of the jaw line was associated with perceived levels of facial attractiveness rating. Analysis of the remaining nine proportion points revealed that they had no significant relationship with ratings of attractiveness.

In addition to the Pearson correlation test, the gender differences in ratings of attractiveness was also examined. An Independent *t*-test was conducted in order to

examine whether there are gender differences in the attractiveness ratings. The analysis revealed that there is no significant difference between male and female participants, $t(68) = -.98$, $p > .05$. Both males ($M = 2.71$, $SD = .69$) and females ($M = 2.56$, $SD = .64$) rate the attractiveness of the photographs the same.

Discussion

The overall results of this study indicate that facial symmetry, which was calculated using 10 specific facial locations, is not significantly related to ratings of attractiveness. Thus, these results fail to support the main hypothesis that facial symmetry increases perceived attractiveness. These findings are not in agreement with previous research done in the area (Baudouin & Tiberghien, 2004; Grammer & Thornhill, 1994; Jones et al., 2001; Rhodes et al., 2001). Unlike the findings in this study, previous data illustrated a significant positive correlation between facial symmetry and perceived attractiveness.

Although the results of our study fail to support the main hypothesis, a close examination of the ten facial locations used in calculating facial symmetry indicated that there was a significant relationship between symmetry in the jaw line and increased rating of facial attractiveness. This means that faces with symmetrical jaw lines are perceived as being more attractive.

Different factors may explain the significant preference towards symmetry in the jaw. Camm, Delwadia, and Waynforth (2005) examined female preference towards masculine facial structures and concluded that masculine features in males, partly determined by measurements of the jaw, evoke significant preference by females

searching for a short-term sexual relationship. Respectfully, Gangestad and Thornhill (1997) revealed a preference towards males expressing heightened facial masculinity.

Future research could expand upon the current study by examining additional factors that may influence the strong tendency to favor symmetry in the jaw area. Furthermore, only 10 specific facial locations served as indicators of facial symmetry. Future studies should include additional facial areas in order to obtain a more accurate measurement of facial symmetry and to determine whether there are other locations within the face that are significantly related to perceived attractiveness.

Another limitation to our study includes the appearance of hair in the photographs presented. Each of the photographs used displayed a different hairstyle or hair color, which may have influenced the rating it received. Future studies may remove the variable of hair from the photographs to eliminate the possibility of it serving as a confounding factor. Since the photographs were shown to all participants in the same order, there might be an order effect on attractiveness ratings. Future studies should use partial counterbalancing to ensure variation in the sequences of the photographs presented.

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Table 1

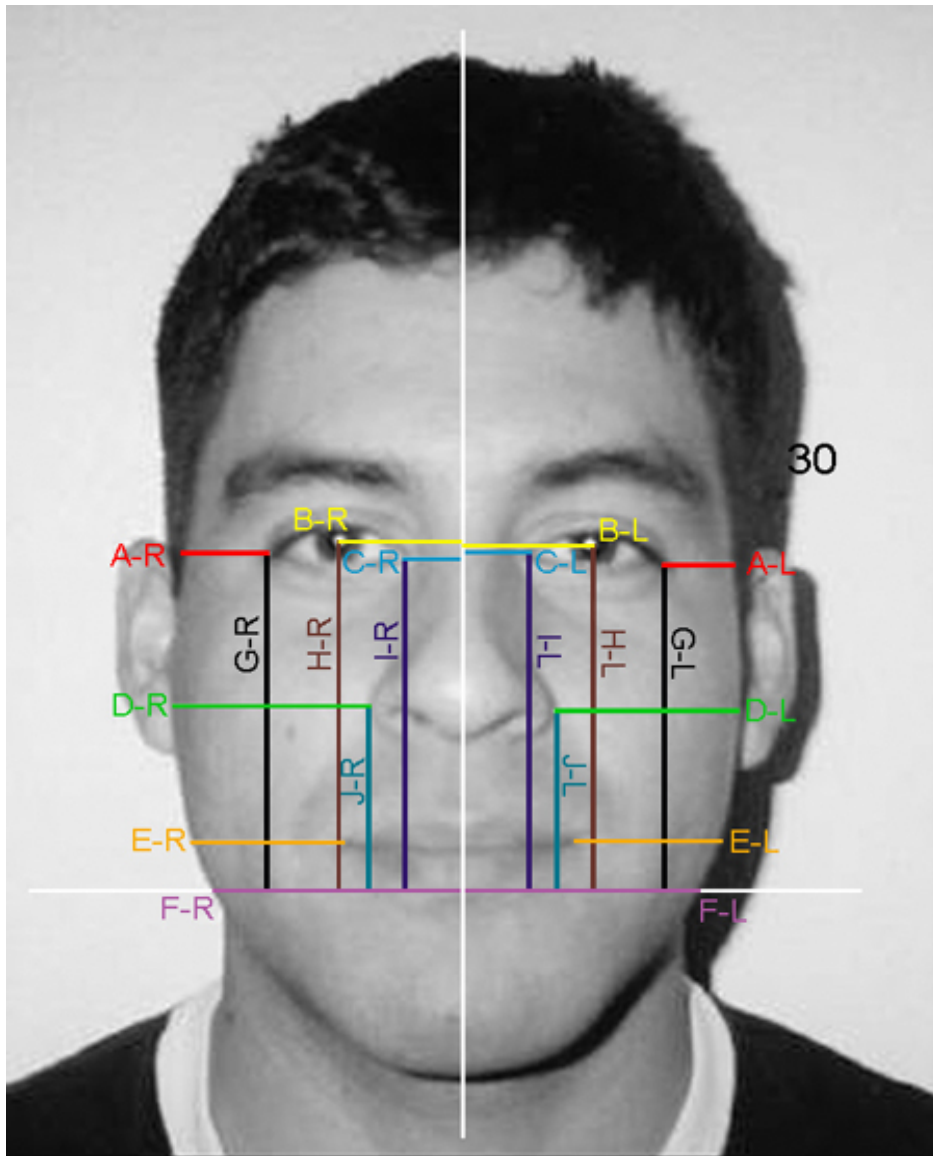
Mean Scores of Symmetric Indicators of Ten Areas on Face and their Correlations with Attractiveness Rating Scores

	Facial Areas	Mean Score	<i>r</i>
1.	A	.98 (.04)	.17
2.	B	.98 (.03)	-.04
3.	C	.97 (.02)	-.05
4.	D	.99 (.03)	-.19
5.	E	.96 (.02)	-.09
6.	F	.95 (.01)	.36
7.	G	.94 (.02)	.10
8.	H	.93 (.03)	-.09
9.	I	.99 (.04)	.23
10.	J	.96 (.05)	.14
	Overall	.95 (.02)	.08

Note. Values in parenthesis are standard deviations. *r* = correlation between the mean score of each area and mean score of attractiveness ratings. Correlation coefficients with an absolute value greater than .33 ($N=35$) are significant at the .05 level according to a two-tailed test.

Appendix A

A breakdown of the 20 facial areas used in the calculation of facial symmetry:



An example of the seven point scale used in evaluating facial attractiveness:

Very Unattractive	Unattractive	Slightly Attractive	Moderately Attractive	Fairly Attractive	Attractive	Very Attractive