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Attractiveness of Legs Length in Poland and Great Britain

Piotr Sorokowski

Institute of Psychology, University of Wroc³aw, ul. J. Dawida 1, 50-527 Wroclaw, Poland
E-mail: sorokowskipiotr@yahoo.co.uk (private)

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ABSTRACT It was shown that the leg-to-body ratio (LBR) is one of the morphological traits that influences a person's attractiveness. However, the results obtained in previous research in this field were contradictory and ambiguous. In the present study, participants from the United Kingdom (N=100) and Poland (N=102), rated the physical attractiveness of five male and five female, three dimensional silhouettes with different LBR. A non-linear relation between LBR and attractiveness was found – male and female silhouettes with short and excessively long legs were perceived as less attractive by both sexes across cultures. It is hypothesized that short and/or excessively long legs are unattractive for they might indicate a maladaptive biological condition, however, it is yet to be proved if this phenomenon is a culturally developed aesthetic preference.

ATTRACTIVENESS IN A BIOLOGICAL PERSPECTIVE

Modern science treats research concerning physical attractiveness very seriously. Thanks to these types of studies, not only do we know that human body attractiveness is related to such morphological traits as height, weight or body shape**,** but we can also explain these preferences in terms of scientific (mostly biological) theories (reviews: Grammer et al. 2003; Pawlowski 2000).

Human body attractiveness is related to such morphological traits as height (Pierce 1996), weight (Tassinary and Hansen 1998) and body shape (Singh 1993). Recently, two studies were presented (Sorokowski and Pawlowski 2008; Swami et al. 2006), in which biological bases were used to explain the phenomenon of certain human preferences for leg length. Several reasons why leg length could have an impact on the general human attractiveness can be indicated. (a) Relative leg length might be a credible indicator of health status (Davey Smith et al. 2001; Lawlor et al. 2004) and the early childhood environmental influences on the organism (illnesses, malnutrition) (Wadsworth et al. 2002). (b) Relatively short legs in women might be a sign of lower reproductive capabilities (Fielding et al. 2008). (c) Leg length might be an indicator of biomechanical efficacy, e.g. due to the running or swimming ability (Cavanagh and Kram 1989; Ropret et al. 1998), which was important in human evolutionary past.

On the other hand, body with extremely long legs should be perceived as unattractive too. Excessively long legs might be an indication of maladaptive genetic diseases (Klinefelter's Syndrome - XXY, Marfan Syndrome (Pyeritz 2000)) or lung malfunctioning (Davey Smith et al. 2001). Sorokowski and Pawlowski (2008) also hypothesized that excessively long legs and therefore excessively small torsos might indicate insufficient space for the proper development of a fetus and consequently lower chances for successful pregnancy amongst females.

METHODOLOGICAL CONTROVERSIES OF PREVIOUS STUDIES

In previous studies, different results were obtained despite the fact that the researchers (Swami et al. 2006; Sorokowski and Pawlowski 2008), were basing their work on the same concept and were explaining their findings in the context of adaptiveness of presented human preferences. In particular, differences occurred when male silhouettes were considered.

Swami et al. (2006) examined 71 British students. The results showed that the highest LBR was rated as most attractive in women, whereas in men the lowest LBR was preferred. Sorokowski and Pawlowski (2008) examined 218 Polish people. Their results showed that pictures

Address for correspondence:
Sorokowski Piotr
52-200 Wysoka, Brzozowa 7a/11, Poland
E-mail: sorokowskipiotr@yahoo.co.uk

of both males and females with legs shorter than average were perceived as less attractive. Although longer legs appeared to be more attractive, this was true only for the slight (5%) leg length increase; excessively long legs decreased body attractiveness for both sexes.

Different results in two very similar pieces of research could have been obtained because of the methodological differences between the studies, or due to different attractiveness models in the United Kingdom and Poland. However, aesthetic preferences in Poland and the United Kingdom appear to be similar. Research conducted on Polish and Western culture samples proves that they are alike in preferences for e.g. WHR (Rozmus-Wrzesinska and Pawlowski 2005; Singh 1993) or height (Fink et al. 2007; Pawlowski 2003).

Therefore, the differences seem to derive from stimuli construction. Swami et al.'s (2006) silhouettes were colorful, whereas Sorokowski and Pawlowski (2008) used blackened ones. When using colorful stimuli, men's musculature is visible which probably results in the participants giving more regard to that characteristic than to the leg length. Blackening the stimuli enables the attention of the raters to be drawn to leg length rather than to chest size and musculature. On the other hand, people are not monochromatic, therefore assessments of Sorokowski and Pawlowski (2008) stimuli are different from how judgments of people are made in real life.

Another very important difference was the procedure of preparing the average stimuli. Swami et al.'s (2006) stimuli were not based on established anthropometric data. The stimuli from Sorokowski and Pawlowski's (2008) study were created electronically from photographs of a man and a woman whose proportions of leg length to the torso length were similar to the mean of the Polish population.

The latest research still does not fully explain the LBR preferences. Therefore, and due to the methodological uncertainties mentioned above, an attempt to replicate the former research with stimuli of higher ecological validity was made. The aim of this study was to verify the following hypotheses:

1) There exist significant differences between aesthetic preferences towards the LBR between Polish and British population.

If this is not true then either:

2a) In females, longer legs are more attractive; in males, shorter legs are more attractive; or:
2b) Both for females and males, longer legs are more attractive; or:
2c) There exists a preference towards the average LBR in a population. or:

Simultaneously, either:

3a) There exists a linear relation between the LBR and attractiveness; or:
3b) There exists a non-linear relation between the LBR and attractiveness.

METHODOLOGY

Method

Three dimensional male and female figurines were used. All stimuli were about 17 cm tall and had natural light skin and brown hair color. The stimuli were naked. The average figurine was of the LBR 0.51 – similar to the mean of both of the studied populations (Dangoury et al. 2002; Gedliczka et al. 2001). The creation of the other figurines involved modification of the average one – elongation or shortening of the legs at the cost of shortening or elongation of the torso. In this study, we used 5 male and 5 female stimuli (the original figurine – LBR=.51, figurines with legs elongated by 7.5% and 15%, and figurines with legs shortened by 7.5% and 15%). Leg length was measured from perineum.

Participants

In order to exclude the influence of race, age and education on the results, participants in the study were British, from Aberdeen, (n=100; 58 females, 42 males) and Polish, from Wroclaw, (n=102; 60 females, 42 males), students aged 19-28 (students from the United Kingdom – M=22.1, SD=3.1; students from Poland - M=22.5, SD=3.5). All participants were Caucasian. The raters were able to compare the figurines and were informed about their different leg length. Female figurines were presented before the male ones. The participants were asked to rate the attractiveness of each figurine using a 7-point scale (ranging from 1 = "very unattractive" to 7 = "very attractive").

RESULTS

To test the attractiveness assessments of different stimuli a GLM model with repeated

Table 1: The main effects of raters' country, raters' gender, stimuli sex, stimuli leg-to-body ratio (LBR) and their interactions.

Source	*F*	*p*	η^2_p
Country	8.5	.004	.03
Participant gender	.4	.5	.01
Stimuli sex	2.6	.1	.01
LBR	97.2	.0001	.33
Country x participant gender	2.6	.1	.01
Country x stimuli sex	.1	.8	.01
Participant gender x stimuli sex	.8	.4	.01
Country x LBR	3.3	.01	.02
Participant gender x LBR	.2	.9	.01
Stimuli sex x LBR	2.4	.057	.01
Country x participant gender x stimuli sex	.6	.5	.01
Country x participant gender x LBR	.4	.7	.01
Country x stimuli sex x LBR	.2	.9	.01
Participant gender x stimuli sex x LBR	.1	.9	.01
Country x participant gender x stimuli sex x LBR	1.0	.4	.01

measures analysis of variance (ANOVA) – 2 x 2 x (2 x 7) ANOVA [rater sex * raters country * (stimuli sex * stimuli leg length)] was used. The Greenhouse–Geisser correction was applied to the results involving LBR, as the Mauchly's Test was shown to be significant for this variable. A summary of the ANOVA results and the main effects of raters country, raters sex, stimuli sex, LBR and their interactions are shown in table 1.

It was found that the attractiveness assessments were influenced by the leg length and raters' country. In both countries, the obtained results proved to be slightly different, nonetheless the strength of this effect was very low (η^2=.03 for "raters country" x "LBR" effect). A post hoc test showed that only the assessment of the average LBR was different in the two countries. British raters assessed the average figurine higher than Polish (p=0.2) (Fig. 1). However, in both countries the most attractive figurines were of the average and the slightly elongated LBR (+7,5 %), and their ratings did not differ significantly. Also, in both countries the attractiveness of those two figurines was significantly higher than all the others (all ps<.01). Ratings of all the remaining figurines were differing significantly from each other (all ps<.01, Post-hoc tests).

DISCUSSION

In the examined populations, very similar results were obtained. It was found that male and female silhouettes with short and excessively long legs were perceived as less attractive across those two cultures. The only one small difference was found between assessments of the average LBR – British participants rated them slightly higher. It closes the discussion about discrepancies between previous findings in terms of different attractiveness patterns in the United Kingdom and Poland.

After the research described in this article had been conducted, other studies regarding the LBR attractiveness were published. Bertamini and Bennet (2009) used stick figures to analyze the LBR attractiveness in three different pieces of research. They showed that particularly female figures with higher leg-to-torso ratios (longer legs) were considered attractive. The main advantage of stick figures is that they allowed the removal of all secondary sex characteristics known to affect attractiveness. However, it is puzzling why the heads in used stick figures were typically too large compared to human anatomy – approximately as high as the legs. It made the measurement of their LBR difficult. In another work (Rilling et al. 2009), the authors presented videos of 43 women, varying in a wide variety of physical dimensions and they found that women with relatively long legs were rated as more attractive. That study represented an advance in reliance on images of real women, however, it (and also Bertamini and Bennet 2009 study) did not check the possible curvilinear associations between the LBR and attractiveness. Frederick et al. (2010) used female computer-generated images portraying eight levels of LBR which fell within the typical range of human variation and asked one thousand raters from the US and GB about their preferences. This last study partially

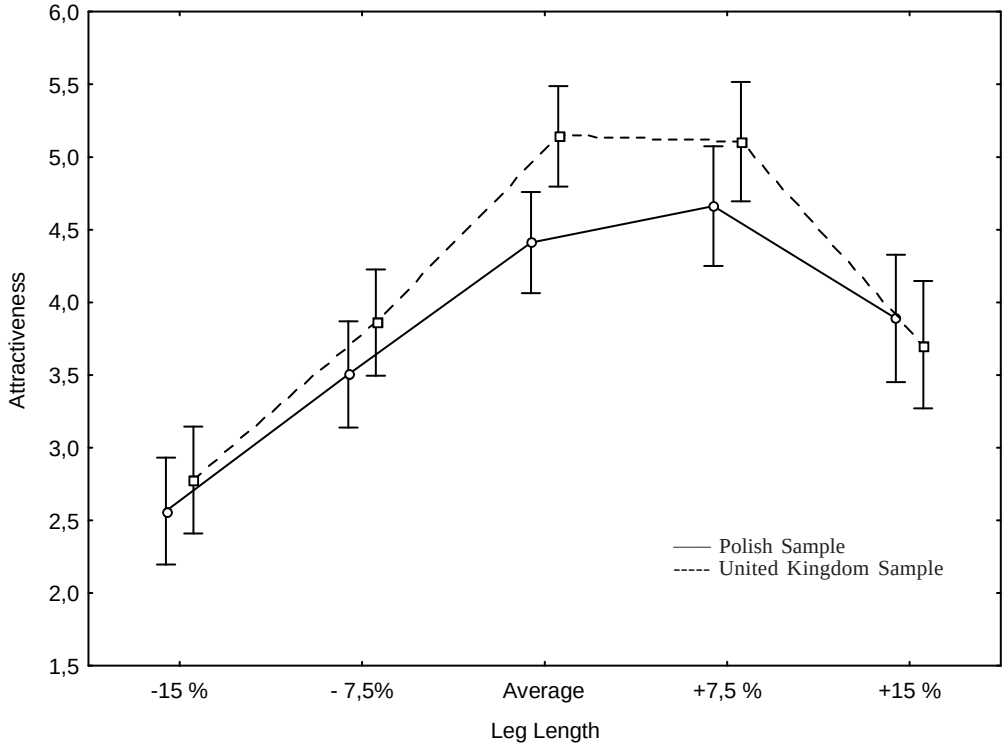

Fig. 1. Mean (with SD) attractiveness assessments (combined for two sexes of stimuli) in Poland and the United Kingdom for figurines with different leg length

confirmed Sorokowski and Pawlowski's (2008) results, although they showed preferences for average (not slightly higher) LBR. It should be mentioned that both Rilling et al. (2009) and Frederick et al. (2010) checked only preferences for women silhouettes.

The results obtained in the described study corresponded more to the hypothesis of the study showing a non-linear relation between the LBR and attractiveness (Sorokowski and Pawlowski 2008; Frederick et al. 2010). That research also demonstrated that relatively longer legs were more attractive in male silhouettes as well (similarly to Sorokowski and Pawlowski 2008; contradictory to Swami et al. 2006). In the present study, the participants rated the average LBR as nearly equally attractive as the ones elongated by 7.5%. However, it could have been related to the fact that the differences between the particular figurines were slightly higher than in the pervious research. However, the fact that shortening the legs influences the attractiveness of a silhouette much more than their elongation confirms former results (Sorokowski and Pawlowski 2008; Bertamini and Bennet 2009; Rilling et al. 2009). A lot might depend on the used stimuli. It can therefore be stated that it is not the long legs that are attractive, but the short and too long ones that are unattractive. Such a conclusion is consistent with the previous studies (e.g. Davey Smith et al. 2001; Frisancho 2007; Lawlor et al. 2004).

Until now, the LBR preferences were investigated only in a few countries. The preference for proportionately longer-legged individuals might therefore be a phenomenon specific to Western cultures. For example, it could be a result of exposure to media images in which women with relatively longer legs are presented as more attractive (as e.g. the preferences for thinness and fatness of a body – Feldman et al. 1988). Sorokowski (2009) found that female models (*N=86*) were 7.93 centimeters taller than the average Polish women. Moreover, the models had legs 6.53cm longer than the average students of the University of Wroclaw (*N=200*). On the other

hand, not only does popular culture create the new trends, but it also uses the natural human preferences. We probably find only the elements that once enabled our ancestors to survive or find a partner plausible (Grammer et al. 2003), so for example short legs, possibly related to poor biological quality, are not that attractive.

CONCLUSION

In conclusion, the obtained results enable us to mention that both for male and female figures, there exists a similar pattern defining the relative length of attractive legs. Male and female three dimensional figurines with short and excessively long legs were perceived as less attractive by both sexes in the United Kingdom and Poland. The next step in research on the LBR attractiveness should be a study enabling to determine how universal the LBR preferences are and which ecological and cultural factors influence them.

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