

Attractiveness Perception of Leg-To-Body Ratio (LBR) in Relation to Health and Fecundity Amongst Some Tertiary Institutions in Northwestern Nigeria

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Abstract

Human body attractiveness is related to morphological traits such as height, weight, and body shape. Surprisingly, few empirical studies on the aesthetic appeal of human legs were examined through leg-to-body ratio as the human legs are conspicuous in erotic contexts. This study was a cross-sectional and cross-cultural study with a sample size of 1470 participants comprising 726 males and 761 females. 610 Hausa, 437 Yoruba, 144 Igbo, and 279 others with an age range of 18-60 years participated in the study. Simple random sampling was used to collect samples, across various tertiary institutions within the northwestern Nigeria. Participants completed the questionnaire in different sites of the research

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area in their working place and within schools. Male and female participants were asked to choose the most and least attractive figure (silhouette) they perceived for a potential mate value. Mann-Whitney test was used to investigate differences in perceived attractiveness between gender, whereas, Kruskal-Wallis test was used to check for significant differences across socioeconomic status (SES), level of education (LoE), and within ethnic groups. The study revealed that a medium leg-to-body ratio was preferred as it seemed to be the most attractive by both males and females, across ethnic groups, levels of education, and SES. However, the reason for chosen it was because it is the ideal size by male while female participant reason was because it is more attractive. Moreover, as SES increases the desire for males and females with high LBR decreases.

Keywords: Leg-to-body ratio, Hausa, Igbo, Yoruba, Attractiveness, Nigeria

INTRODUCTION

Physical attractiveness is a key factor in social communication, and through this communication process, we attractively brand and express ourselves (Tanabe *et al.*, 2023). Women's physical attractiveness is associated with health and fertility, but various fashion accessories could act, however, as supernormal stimuli and may enhance physical attractiveness to the opposite sex (Prokop, 2022). The sexually attractive features of the female body are an essential part of mate choice (Meskó *et al.*, 2021). Similarly, Tanabe & Yamamoto, (2024) also believe that males and females attach meanings that are related to reproductive function and sociocultural standards of beauty, to the trunk silhouette, and movement of the head and whole body (including the leg). The length of the legs is an often-emphasized aspect of attractiveness and has been investigated using the leg-to-body ratio (LBR) (Kiire, 2015).

Leg-to-body ratio (LBR) is defined as the ratio of total leg length to total height (Versluys *et al.*, 2018). LBR is also defined as the ratio of leg length relative to the torso, trunk, or body including the head (Swami *et al.*, 2006). High LBRs in adulthood are associated with high reproductive ability in females and can be correlated with the environment in which an individual grew up. For example, longer legs are associated with better socioeconomic circumstances in childhood. Leg length has also been negatively related to early childhood illnesses and malnutrition, lower early-life socioeconomic status, and increased risk of various illnesses. The attractiveness of LBR may be influenced by both cultural and biological factors. There is evidence that leg length attractiveness is associated with cultural variables. Analysis of attractive human shapes in works of art over many centuries suggests that the ideal LBR of women but not of men has increased over time, as modern attractive women have significantly longer legs than did attractive antecedents. This may be the result of cultural influences on beauty standards associated with LBR because beauty ideals surrounding long legs are strongly and positively enforced in Western culture. This line of thinking was confirmed in a cross-cultural study, in which data from twenty-seven nations indicated that LBR preferences across different countries were only slightly modified by the participants' origin. Moreover, among the traditional Himba tribe which is relatively isolated from Western culture, participants perceived relatively high LBR as an indicator of attractiveness for men, but not for women. Thus, patterns of attractiveness seem to be formed by specific cultural and environmental influences (Sabiniewicz *et al.*, 2015)

Longer legs enhanced ratings of physical attractiveness for women, but no such finding has been reported for men. Recent studies have shown that a higher female LBR, indicating longer legs to the torso and head, was judged as being more physically attractive than a lower LBR (Swami *et al.*, 2007). For example; High-class fashion journals depict women with an extreme length of limb, and decorative art does the same for both men and women. When the artist

wishes to represent the lower orders, as such, or the comic, he draws people with exaggeratedly short limbs and makes them fat. Evidence that persons with longer legs are seen as more attractive. In one study in Hong Kong, researchers presented participants with three-dimensional images of people and reported that the participants found long-legged women more attractive (Frederick *et al.*, 2010).

By contrast, the preferred male LBR was the inverse: lower LBR was judged as more attractive than higher LBR. One possible explanation for this pattern of findings is based on the LBR acting as an evolved cue of developmental stability and health (Swami *et al.*, 2007). A different possibility is that the LBR plays a differential role in the judgments of men and women. As noted earlier, the LBR is a sexually dimorphic feature, with women tending to have higher LBRs than men. If this sex difference between men and women is noticed by observers, is possible that over time a higher LBR becomes associated with femininity and a shorter LBR with masculinity. Moreover, because peak growth occurs during adolescence, a higher LBR may also be a cue of youthfulness. Thus, sexual dimorphism in LBR may have evolved due to a human male preference for women with higher, youthful LBRs. Therefore, women who exhibit the hallmark version of the feminine trait will be viewed as highly attractive (Swami *et al.*, 2006). However, it is also possible that LBR preferences are a culture-bound phenomenon specific to Western or Anglo-American spheres of influence. That is, the preference for proportionately longer-legged women could have arisen as a result of exposure to media images in which women with longer legs relative to the torso are imbued with positive qualities (Swami *et al.*, 2007).

To the best of my knowledge, there are relatively few or no published studies that assess attractiveness or mating preference in the Nigerian population using a leg-to-body ratio hence, the significance of this study is to understand the variation across the major ethnic groups in Nigeria.

MATERIALS AND METHOD

Study Area

The study was a cross-cultural study with a sample size of about 1470 participants, 726 males, and 761 females, comprising 610 Hausa, 437 Yoruba, 144 Igbo, and 279 others with an age range of 16-45 years. Simple random sampling was used. The sample was collected from the three major Nigerian ethnic groups (Hausa, Igbo, Yoruba, and others) from various tertiary institutions within northwestern Nigeria. Participants completed the questionnaire in different sites of the research areas, in their working place, and within schools (Federal University Dutse, Bayero University Kano, Ahmadu Bello University Zaria, Kaduna State University, Kaduna State Polytechnic, and Dutse Polytechnic). Male participants were asked to choose the most attractive figure they perceived, that they were willing to marry (for a long-term relationship) or for a short-term relationship.

Participants were given a paper containing the purpose of the study (the cover story and consent form), other demographic details of the participants, and a page containing stimuli figures of LBR.

Statistical Analyses

Data was reported using frequency, percentage, and descriptive statistics where mean and standard deviation (SD) were computed to check for the level of similarities and dispersion

between anthropometric variables. Spearman rank correlation was used to check for the strength of the relationship between SES and attractiveness ratings of the stimuli. Mann-Whitney test was used to investigate differences in perceived attractiveness. Kruskal-Wallis test was used to check for significant differences in perception of attractiveness across SES, level of education, and within ethnic groups. Statistical significance was at $p < 0.05$. SPSS version 20 (IBM, Corp., New York) was used for the data analyses.

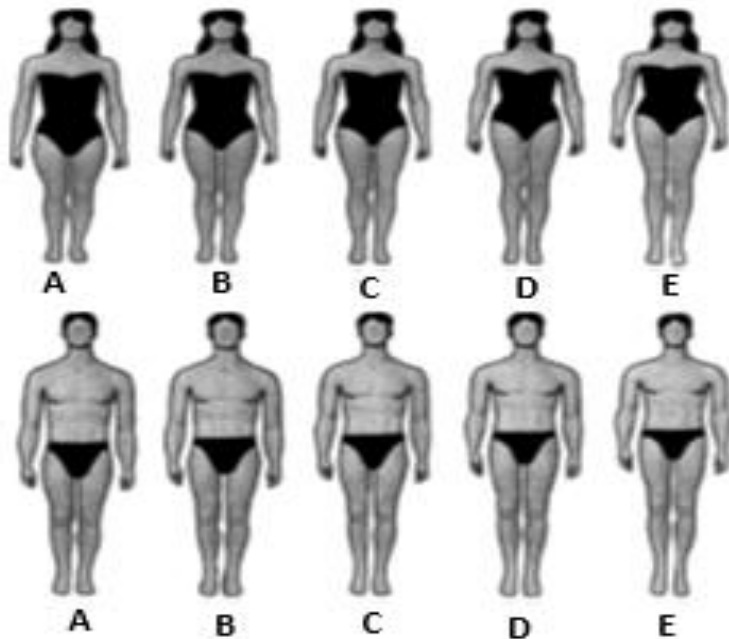


Fig. 1: Leg to Body Ratio stimuli (Swami *et al.*, 2006)

RESULTS

Table 1 shows sex differences in perceived attractiveness ratings of LBR (leg to body ratio). A significant sex differences was observed in most attractive male LBR, desired male LBR, reason for the desired male LBR, most attractive female LBR figure for a potential mate value, desired female LBR. In all the variables that exhibited significant sex differences, the males have higher median value.

Table 1: Sex differences in perceived attractiveness ratings of LBR stimuli

Variables	Median (25 th , 75 th)		U-value	p-value
	Male (n=726)	Female (n=761)		
Least attractive male LBR figure [A(1)-E(5)]	2(1,5)	2(1,4)	2.50×10^5	0.228
Most attractive male LBR figure [A(1)-E(5)]	3(3,4)	3(2,4)	2.23×10^5	0.052
Desired male LBR [A(1)-E(5)]	3(3,4)	3(2,4)	2.13×10^5	0.000
Reason for the desired male LBR	1(1,2)	2(1,2)	2.09×10^5	0.000
Least attractive female LBR figure for a potential mate value [A(1)-E(5)]	2(1,4)	2(1,4)	2.55×10^5	0.814
Most attractive female LBR figure for a potential mate value [A(1)-E(5)]	3(2,4)	3(2,4)	2.22×10^5	0.000
Desired female LBR [A(1)-E(5)]	3(2,4)	3(2,4)	2.19×10^5	0.000
Reason for desired female LBR	2(1,2)	2(1,2)	2.18×10^5	0.163

LBR, Leg to body ratio; [A(1)-E(5)], 1(very low leg length) 2(low leg length) 3(mediaum leg length) 4(high leg length) 5(very high leg length); $P < 0.05$; SES, socioeconomic status

Table 2 shows ethnic differences on attractiveness ratings of LBR, it was observed that there is significant difference of ethnicity on the following attractiveness ratings namely; least attractive male LBR figure, most attractive male LBR figure, desired male LBR, reason for the desired LBR, least attractive female LBR for a potential mate value, most attractive female LBR for a potential mate value, similar female LBR among the variables exhibiting significant differences, a higher median value was observed in other ethnic group except for least attractive male LBR figure, whereas, for least attractive female LBR for a potential mate value, the Yoruba had higher median value, and desired male LBR where Igbo had higher median value.

Table 2: Ethnic differences on attractiveness ratings of LBR stimuli

Variables	Median (25 th , 75 th)				F-value	p-value
	Yoruba (n=437)	Igbo (n=144)	Hausa (n=610)	Others (n=279)		
Least attractive male LBR figure [A(1)-E(5)]	3(1,5) ^{abc}	2(1,4) ^a	2(1,4) ^{bd}	2(1,4) ^{cd}	8.62	<0.001
Most attractive male LBR figure [A(1)-E(5)]	3(2,3) ^{abc}	3(2,4) ^a	3(2,4) ^b	3(2,4) ^c	7.79	<0.001
Desired male LBR [A(1)-E(5)]	3(2,4) ^{abc}	3(3,4) ^{ad}	3(2,4) ^{bd}	3(2,4) ^c	7.489	<0.001
Reason for the desired male LBR	2(1,2) ^{cd}	1(1,2) ^{ad}	1(1,2) ^{bd}	2(1,2) ^{ab}	2.805	0.039
Similar male LBR [A(1)-E(5)]	3(2,3)	3(2,3)	2(2,3)	3(2,3)	1.508	0.211
Least attractive female LBR figure for a potential mate value [A(1)-E(5)]	3(1,4) ^{abc}	2(1,4) ^a	2(1,4) ^b	2(1,4) ^c	5.518	0.001
Most attractive female LBR figure for a potential mate value [A(1)-E(5)]	3(2,4) ^{bc}	3(2,4) ^a	3(2,4) ^b	3(2,4) ^c	4.521	0.004
Desired female LBR [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	3(2,4)	2.102	0.098
Reason for desired female LBR	3(1,2)	2(1,2)	2(1,2)	2(1,2)	0.34	0.796
Similar female LBR [A(1)-E(5)]	2(2,3) ^c	2(2,3) ^b	2(2,3) ^a	3(2,4) ^{abc}	5.872	0.001

LBR, Leg to body ratio; [A(1)-E(5)], 1(very low leg length) 2(low leg length) 3(medium leg length) 4(high leg length) 5(very high leg length); P<0.05; SES, socioeconomic status; Similar superscript indicates significant difference

Table 3 shows effect of level of education on attractiveness ratings of LBR, it was observed that there is significant difference of level of education on least attractive female LBR figure for a potential mate value with a higher median value observed in tertiary level of education.

Table 3: Level of education differences on attractiveness ratings of LBR stimuli

Variables	Median (25 th , 75 th)			F-value	p-value
	Primary (n=110)	Secondary (n=318)	Tertiary (n=939)		
Least attractive male LBR figure [A(1)-E(5)]	2(1,3)	2(1,4)	2(1,4)	1.164	0.313
Most attractive male LBR figure [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	0.296	0.744
Desired male LBR [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	0.585	0.557
Reason for the desired male LBR	1(1,2)	1(1,2)	1(1,2)	2.434	0.088
Similar male LBR (male only) [A(1)-E(5)]	2(2,4)	2(2,3)	3(2,3)	1.802	0.166
Least attractive female LBR figure for a potential mate value [A(1)-E(5)]	2(1,3) ^{ab}	2(1,4) ^a	2(1,4) ^b	7.114	0.001

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Most attractive female LBR figure for a potential mate value [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	1.752	0.174
Desired female LBR [A(1)-E(5)]	3(2,3)	3(2,4)	3(2,4)	0.022	0.978
Reason for desired female LBR	2(1,2)	2(1,2)	2(1,2)	1.248	0.287
Similar female LBR (female only) [A(1)-E(5)]	2(2,3)	2(2,3)	2(2,3)	0.047	0.954

LBR, leg to body ratio; [A(1)-E(5)], 1(very low leg length) 2(low leg length); 3(medium leg length) 4(high leg length) 5(very high leg length)

Table 4 shows socioeconomic status on attractiveness ratings of LBR, it was observed that there is significant difference of socioeconomic status on the following attractiveness ratings namely; desired male LBR, reason for the desired male LBR, desired female LBR, reason for desired female LBR, similar female LBR among the variables exhibiting significant difference a higher median value was observed in medium socioeconomic status except for desired male LBR where low socioeconomic status had higher median value.

Table 4: Socioeconomic status differences on attractiveness ratings of LBR stimuli

Variables	Median (25 th , 75 th)			F-value	p-value
	High SES (n=695)	Medium SES (n=183)	Low SES (n=443)		
Least attractive male LBR figure ¹ [A(1)-E(5)]	2(1,5)	2(1,4)	2(1,4)	2.689	0.068
Most attractive male LBR figure ¹ [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	0.415	0.660
Desired male LBR [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	5.633	0.004
Reason for the desired male LBR	1(1,2) ^{bc}	2(1,2) ^{ac}	2(1,2) ^b	3.809	0.022
Similar male LBR (male only) [A(1)-E(5)]	3(2,3)	2(1,3)	2(2,3)	1.141	0.320
Least attractive female LBR figure for a potential mate value [A(1)-E(5)]	2(1,4)	2(1,4)	2(1,4)	0.969	0.380
Most attractive female LBR figure for a potential mate value [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	0.538	0.584
Desired female LBR [A(1)-E(5)]	3(2,4)	3(2,4)	3(2,4)	14.036	0.001
Reason for desired female LBR	2(1,2)	2(1,2)	2(1,2)	3.724	0.024
Similar female LBR (female only) ¹ [A(1)-E(5)]	3(2,3) ^a	3(2,4) ^a	2(2,3) ^a	3.683	0.026

LBR, Leg to body ratio; [A(1)-E(5)], 1(very low leg length) 2(low leg length) 3(medium leg length) 4(high leg length) 5(very high leg length); P<0.05; SES, socioeconomic status; Similar superscript indicates significant difference

DISCUSSION

The present study observed that both males and females preferred medium leg-to-body ratios (LBR), reflecting indifference to specific limb proportions in attractiveness judgments. The findings obtained support the hypothesis that one should prefer average leg length (e.g., Moreland & Zajonc, 1982; Zajonc, 1968; Cloud and Perilloux 2014; Burch and Widman, 2024). The LBR may be expected to play a role in judgments of both male and female physical attractiveness. If a higher LBR is attractive because it is positively associated with stable development and overall well-being in both men and women, it may be predicted that a higher LBR should be maximally attractive for both genders. By contrast, if a higher LBR is perceived as being feminine, then only women may be considered maximally attractive with high LBRs. The LBR preference for men may either be the default (that is, a preference for the average) or possibly for men with lower LBRs if such a trait is considered masculine (Swami *et al.*, 2006). This contrasts with some research suggesting preferences for both low and above-average LBRs. These findings contrast with Versluys & Skylark (2017), who reported variable preferences for LBR across cultures and education levels. Differences in results might be attributed to variations in stimuli and methodological approaches across studies. Our results

differ as well from those obtained by Swami *et al.* (2006) who found that a shorter leg-to-body ratio for men is perceived as more attractive while the reverse is the case for women. The male preference for a medium leg-to-body ratio in this study is another confirmation of the African traditional values and customs where male domination is a characteristic of most societies. Previous studies have shown a more liberal Western societies have their males showing preference for women with high LBR (Pierce, 1996; Pawlowski & Koziel, 2002; Swami *et al.*, 2006). In previous studies, attention was drawn to the fact that women should have an evolved preference for taller men; for instance, women prefer men who are taller than themselves (Pawlowski, 2003), and taller men's advertisements often elicit more responses (Pawlowski & Koziel, 2002) but Buss (1985; Furnham and McClelland, 2015; Zhao *et al.*, 2023; Klumper *et al.*, 2024) reported that women are more concerned with a prospective partner's potential earning ability, while men pay relatively more attention to physical factors, such as attractiveness and health.

In this study, participants consistently preferred a medium leg-to-body ratio (LBR) of 1.2, designated as Figure C, for both males and females. Despite this preference, participants were not clear-cut in their judgment, as Figure C was also rated as both the least and most attractive. This confusion might be due to the participants' excitement or difficulty in distinguishing between the LBR stimuli.

On the other hand, a 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.

Ethnically, all groups preferred Figure C as their desired LBR, with reasons varying, where some groups saw it as ideal, while others found it more attractive. However, Hausa participants diverged by choosing Figure B as the least attractive. The results are consistent across different education levels, with a preference for Figure C, though reasons differed, with higher education participants finding it more attractive. The little differences in the ethnic group are not unrelated to their deep-rooted culture and traditional values when it comes to attractiveness. The body somatotype of the Hausas is more ectomorphic than the Igbos and Yorubas (Mustapha *et al.*, 2020). Regardless, Kurzban and Weeden (2005) found the agreed-upon mate values for both sexes were related almost entirely to observable physical attributes like age, attractiveness, body mass index (BMI), and height and not those less observable characteristics like education, religion, socio-sexuality or ideas about children.

Bauldry *et al.* (2016) discuss how attractiveness may correlate with educational attainment, particularly among those with lower socioeconomic resources. They suggest that perceived attractiveness can act as a substitute for other resources and potentially enhance educational outcomes, particularly for those from disadvantaged backgrounds.

In this study, participants across different socioeconomic statuses (SES) and ethnic groups preferred a medium leg-to-body ratio (LBR) of 1.2, represented by Figure C. However, there were some differences in how this preference was articulated. Medium and low SES individuals preferred Figure C because it was more attractive, while high SES individuals saw it as the ideal size. The medium SES group was the only one to find Figure B least attractive, while other groups also preferred Figure C for both the least and most attractive categories. Bauldry *et al.* (2016) suggest that parental socioeconomic resources can enhance children's

perceived attractiveness through mechanisms like better health, fashionable clothing, and positive personality traits. This study found a negative correlation between SES and the desired LBR, indicating that as SES increases, the perceived preferred LBR (Figure C) decreases. Conversely, higher SES was associated with an increased preference for similar female LBR.

CONCLUSION

The medium leg-to-body ratio was chosen to be the medium size because it seems to be attractive to both males and females, across ethnic groups, levels of education, and SES. However, as SES increases the desire for male and female LBR as figure C (medium or average LBR) and the reason for choosing it decreases, and likewise, similar female LBR for same figure C increases.

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