

Short Communication

Second to fourth digit ratio in Nigerian Igbos and Yorubas

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This study was carried out to investigate any tribal and sexual differences in the second to fourth digit ratio (2D:4D) of Igbos and Yorubas in Nigeria. Eight hundred and forty (840) Nigerian adolescents were used for the study. These comprised 210 Igbo males, 210 Igbo females, 210 Yoruba males and 210 Yoruba females. A digital vernier caliper was used to measure the length of the second digit (2D) and fourth digit (4D). The ratio 2/4D was then calculated for each subject. Result from the study showed 2/4D was sexually dimorphic in the two tribes. Males demonstrated lower digit ratio (0.96 on the right hand of Igbos and Yorubas and 0.94 on the left hand of the two tribes) than females (0.97 on the right hand and 0.95 on the left hand). The differences observed between males and females in both tribes were significant ($p < 0.05$). However, no significant difference was observed between the two groups ($p > 0.05$). Thus, digit ratio amongst Yorubas and Igbos is sexually dimorphic and may not necessarily be affected by tribe and ethnicity. It may be more related by latitude as suggested by various researchers.

Key words: Digit ratio, Igbos and Yorubas.

INTRODUCTION

The second to fourth digit ratio (2D:4D) is the ratio of the length of second digit (index finger) as measured from bottom crease to the top of the finger to the ratio of the length of the fourth digit (ring finger) (Manning, 2002). The second to fourth digit ratio is lower in men than women (Phelps, 1952; Manning et al., 1998; Manning et al., 2000; Manning et al., 2003; Lutchmaya et al., 2004). These authors reported that women generally have a digit ratio of about 1.0 while men have digit ratio of about 0.96. This means that in females, the index and ring fingers have almost the same length. Reports have indicated that 2D:4D ratios vary greatly between ethnic groups (Manning et al., 2000; Manning et al., 2004). The variation has been said to be related to latitude, such that more northerly populations have higher digit ratios. Some authors have demonstrated correlation between digit ratio and some traits. Such traits include: Autism (Manning et

al., 2001), physical aggression (Allison and Peter, 2004), etc. Second to fourth digit ratio has also been shown to have correlation in sporting and physical ability such as skiing, soccer ability (Manning and Taylor, 2001), and musical ability (Sluming and Manning, 2000). A number of studies have similarly shown correlation between second to fourth digit ratio in sexual orientation such as bem sex role score in women (Csatho et al., 2003), lesbianism (Brown et al., 2002), gay (McFadden and Paganem, 1998), and fraternal birth order (Williams et al., 2000).

A low 2D:4D ratio has been shown to correlate with high testosterone level which is characteristic of males, while a high 2D:4D is correlated with low testosterone level, a characteristic of females (Manning, 2002). The first report on digit ratio of Nigerians was made by Oladipo et al. (2006). The results of that study showed sexual difference but no ethnic difference between the two ethnic groups (the Igbos and Urhobos) investigated.

Thus, the present study is an extension of the first study. In this study, two tribes which are a bit far apart (that is, the Yorubas and Igbos) were used to investigate any tribal and sexual differences.

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Table 1. Mean and standard deviation (SD) of the length of second digit (2D), fourth digit (4D) and digit ratio (2D/4D) of Igbos.

Parameter	Males		Females	
	Right	Left	Right	Left
Mean 2D±SD (cm)	7.48±0.57	7.36±0.57	7.17±0.48	7.11±0.48
Mean 4D±SD (cm)	7.70±0.60	8.46±0.60	7.44±0.04	7.45±0.51
2D/4D±SD	0.96±0.04	0.94±0.04	0.97±0.03	0.95±0.04
Sample size	210	210	210	210

Table 2. Mean and standard deviation (SD) of the length of second digit (2D), fourth digit (4D) and digit ratio (2D/4D) of Yorubas.

Parameter	Males		Females	
	Right	Left	Right	Left
Mean 2D±SD (cm)	6.98±0.63	6.87±0.59	6.87±0.49	6.82±0.47
Mean 4D±SD (cm)	7.20±0.58	7.31±0.52	7.09±0.52	7.14±0.48
2D/4D±SD	0.96±0.04	0.94±0.05	0.97±0.04	0.95±0.04
Sample size	210	210	210	210

MATERIALS AND METHODS

A total of eight hundred and forty (840) Nigerian adolescents of age between 13-19 years were used for the study. The sample comprised 210 normal Igbo males, 210 Igbo females, 210 Yoruba males and 210 Yoruba females. The subjects were selected at random from Anambra, Imo, Ogun, Oyo and Osun States. They were purely either Igbos or Yorubas by both parents and grand parents.

The length of the second digit (2D) and fourth (4D) of the left and right hand of each subject, were measured with the aid of digital venier caliper from the tip of the digit to the ventral proximal crease. Where there was a band of crease at the base of the digit, the most proximal crease was used (Bernhard et al., 2004). Subjects who reported injuries or deformities to the second and fourth digits were excluded from the study.

All measurements were made twice with digits fully extended. The average of the two measurements was taken. Data were analyzed using z-test.

RESULTS AND DISCUSSION

The results of this study are presented on Tables 1 and 2. Table 1 shows the mean and standard deviation (SD) of the second digit (2D), fourth digit (4D) and the second to fourth digit ratio (2D:4D) of Igbo's. The results on this table showed significant difference between male and female in both hands ($p < 0.05$). Table 2 shows the mean and standard deviation (SD) of the second digit (2D), fourth digit (4D) and the second to fourth digit ratio (2D:4D) of Yorubas. There was significant difference between male and female of this tribe in both hands ($p < 0.05$). However, no significant difference was found when the two tribes were compared ($p > 0.05$).

Our findings suggest that the 2D:4D ratio is sexually dimorphic and this may be associated with testosterone concentration as suggested by earlier investigations

(Manning et al., 1998). Prenatal testosterone concentrations are thought to modify development rate (McEwen, 1981; MacLusky and Naftolin, 1981; Bardin and Catterall, 1981; Geschwind and Galaburda, 1985). One example of this modification is found in the development of the epidermal ridges of the digits. Jamison et al. (1993) have found that dermatoglyphic asymmetry and testosterone concentrations are positively correlated in adult males. They have also argued that adult testosterone concentrations are likely to be correlated with fetal concentrations.

Our findings of a negative relationship between 2D:4D ratio and tribe suggests that 2D:4D may not necessarily be influenced by ethnicity or tribes but probably by race from different countries. This is more likely due to the fact that 2D:4D is related to latitude, such that more northern populations have higher digit ratio (Manning et al., 2000, 2004). Thus, significant differences are more likely going to be observed when comparing races from different countries along different latitude than ethnic groups or tribal groups.

In conclusion, 2D:4D showed strong sexual difference with no ethnic differences amongst the Nigerian Igbos and Yorubas which still agree with the previous report on Nigerian Igbo's and Urhobos.

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