



PREVALENCE OF LEFT HANDEDNESS AMONG STUDENTS OF BAYERO UNIVERSITY, KANO

Auwalu, S. A., Ibrahim, S. and Abdullahi I. L.

Department of Biological Sciences, Faculty of Life Sciences, College of Natural and Pharmaceutical Sciences, Bayero University, Kano Nigeria
Phone number: +2348036384777
saumar.bio@buk.edu.ng, suwaibaaauwal@gmail.com

ABSTRACT

In this study, environmental and possible inheritance from parents to off springs were evaluated as determinant of for left handedness among Bayero University, Kano students. Social and demographic data were obtained using a structured questionnaire which includes: number of left-handed individuals, perception of respondents on intelligence and creativity of left handers. Out of the 540 sampled individuals, 7.3% were left-handed, 92.1% were right-handed and 0.6% ambidextrous. With regards to intelligence and creativity, 74.38% generally believed that left handers are more intelligent and creative than right handers. The study also shows that there was a significant difference for hand preference in left handers ($p < 0.005$). Left-handers preferred to use their left hand for uni-manual activities. It is apparent from the study, that left-handed individuals in the University were very few and the inheritance of this trait can be associated with either the father or the mother, but has more effect on the mother.

INTRODUCTION

Handedness is the natural or biological preference for using one hand more than the other in performing tasks depending on which hemisphere is dominant for the task (Rice, 1998). People are said to be right handed if they use right hand most of the time, and left handed if they prefer left hand and, ambidextrous, if they use both hands equally well and approximately on equal amount of the time. Left-handedness is the preference for the left hand over the right for everyday activities such as writing and throwing. It is relatively uncommon; about 8-15% of people all over the world are said to be left-handed (Gursoy, 2009).

Some environmental factors are regarded responsible for the development of left handedness phenomenon. These include; birth difficulties, season of birth, prenatal ultrasound, maternal smoking during pregnancy, low birth weight, diffused brain damage resulting from stress during birth, and testosterone level during early development (Milenkovi *et al.*, 2008). The contribution of genetics to handedness were supported by a number of studies involving both families of concordant twins and adopted individuals (Annett, 1985; Corballis 1997; Klar 1996; McManus, 1985).

Left-handedness is closely identified with mental illnesses like schizophrenia and language

difficulties like dyslexia and stuttering (McManus, 1991). Left handed individuals seem to be highly creative, and they have more power of perception as compared to right-handers (Llaurens *et al.*, 2009). It is pointed out that mathematicians, musicians, architects, and artists are more commonly left-handers than would be expected (Santrock and John, 2008) e.g. Barack Obama, Maradona, Messi, Danmaraya Jos etc. The aim of the study is to evaluate the occurrence and distribution of left-handedness among students of Bayero University, Kano

MATERIALS AND METHODS

Study area

The study was conducted in Bayero University, Kano, (B.U.K). The university is situated in ancient city of Kano, Kano state, Nigeria. It was founded in 1977, when it was renamed from Bayero University College and upgraded from University College to University. It has a total number of 31919 students with 26,343 being undergraduate students for 2014/2015 academic session.

The New campus has coordinates of 11°58'25"N, 8°25'37"E while old campus is located on 11.97772N, 8.478E (History of BUK, 2007).

Measure of handedness based on questionnaire

A structured questionnaire tagged “prevalence and hormonal study of left handedness” was designed and administered to students in the Faculty of Sciences and College of Medical and Allied Sciences. It includes specific and general questions that provide useful data on their socio-demographic characteristics and hand preference for different activities. A purposive sampling technique was employed in this study. Seven hundred questionnaires were administered, a total of 599 students participated in the study, but only 540 students filled the questionnaires. The questionnaires were stratified into different strata of student types, that is, handedness, gender, tribe, origin, age and other relevant information. It contains two sections; section A and B. Section A was the “demographic” section while section B consisted of items on handedness, hand preference for uni-manual activities, family history of handedness, and other related information.

Data analysis

The data obtained were organized and analysed statistically using Excel Windows 2007 for the

barcharts and Sigma Stat 3.5 (Statistical Software for windows) for chi square, to test for associations between categorical variables.

RESULTS AND DISCUSSION

There are differences to which people use their right hand as a preferred hand in their manual activities such as writing, eating, sewing, tooth brushing, or throwing. Handedness is assessed based on the preferred hand for particular activities. The results are presented with the following table and figures below. The distribution of respondents by their socio-demographic characteristics is presented in Table 1 above. Out of the 540 participants, 299 (55.40%) were males while 241 (44.60%) were females. This shows that majority of the respondents that constituted the target population were males. Based on ages, 286 (52.96%) of the respondents were within the age range of 16-21 years constituting the majority of the respondents. 211 (39.07%) were within 22-27 years of age and 21 (3.90%) were within the age range of 28-33 years and 6 (1.11%) were above 33 years.

Table 1. Socio-demographic data of the participants

Variables	Group	Frequency	Percentage
Sex	Male	299	55.40
	Female	241	44.60
Age (years)	Total	540	100
	16-21	286	52.96
	22-27	211	39.07
	28-33	21	3.90
	Above 33	6	1.11
	NR	16	2.96
Tribe	Total	540	100
	Hausa/Fulani	453	83.90
	Yoruba	22	4.07
	Igbo	2	0.37
	Kanuri	7	1.29
	Nupe	13	2.41
	Others	43	7.96
State of origin	Total	540	100
	Kano	330	61.11
	Kaduna	16	2.96
	Katsina	28	5.18
	Jigawa	39	7.22
	Niger	11	2.04
	Kogi	11	2.04
	Kwara	10	1.85
	Bauchi	12	2.22
	Others	42	7.78
	NR	41	7.59
	Total	540	100

Key NR: No response

Special Conference Edition, April, 2022

The figure above shows the percentage distribution of handedness among the population studied. Left-handers accounted for 7.3% of the population while right-handers were highest with percentage of 92.1%, and ambidextrous with the least percentage of 0.6%. This finding is in accordance with Ellis *et al.* (1988) and Szaflarski *et al.* (2008) who reported that the incidence of left-handedness in the general population is about 13% during teenage years and decline gradually with age, reaching about 6% in the seventh and eighth decades of life. An unpublished, large-scale systematic review constituting 1.8 million participants found that the incidence of left-handedness lies between 7.52% and 17.42% (Papadatou-Pastou *et al.*, 2010). The Frequency of preference for the use of hand in specific activities by sampled population of left handed students is shows that there was a

significant difference between the hand preferred by left handers in carrying out these activities at $p < 0.005$ level of significance. The study shows that most left handers preferred to use their left hand for most of the activities like writing, tooth brushing and combing hair with 86.24%, 97.28% and 84.62% respectively more than the right hand, because this is where their individual strength lies. But for holding spoon, 64.14% preferred to use their right hand and only 35.84% preferred their left hand. This may be due to tradition/custom of parents forcing their children to use their right hand in activities like eating or writing. Masud and Ajmal (2012) reported that, generally, eating and writing are considered important tasks to be performed with the right-hand. Usually, religious factor becomes dominant for suppression of left-hand for eating, drinking, and performing religious rituals.

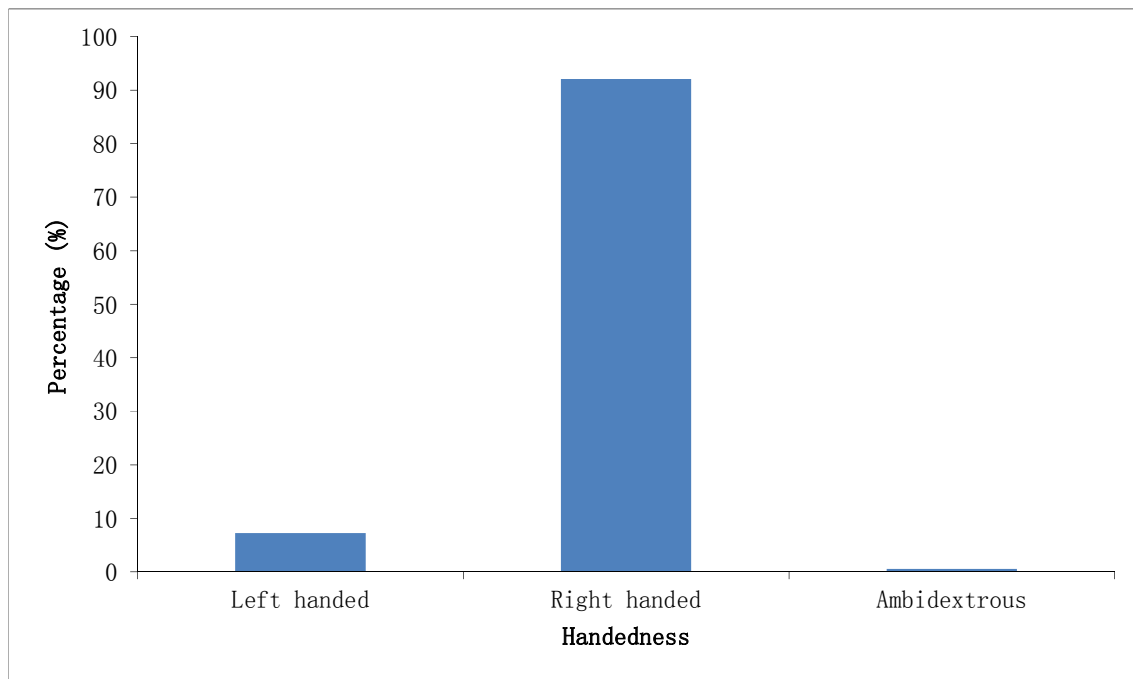


Figure I. Handedness distribution among students of Bayero University Kano

Table 2. Frequency of Left handed preference of some specific activities

Activities	Right hand	Left hand	Total
Writing	30 (13.76)	188 (86.24)	100
Tooth brushing	46 (20.72)	176 (97.28)	100
Holding cup	92 (47.67)	101 (52.33)	100
Holding spoon	127 (64.14)	71 (35.84)	100
Hair brush/comb	30 (15.38)	165 (84.62)	100
Total	383 (30.59)	869 (69.41)	1252
Chi square	195.95		
p	<0.005		

Table 3. Percentage frequency of the inheritance pattern of handedness among the study participants

Handedness of parents		% left handedness in offsprings		
Father	Mother	Sons	Daughters	Total
R	R	85 (43.59)	61 (31.28)	74.87
R	L	20 (10.26)	7 (3.59)	13.85
L	R	6 (3.08)	12 (6.15)	9.23
L	L	3 (1.54)	1 (0.51)	2.05
Total		58.47	41.53	100

Key

R= right handed

L= left handed

The result for the percentage frequency of the inheritance of handedness is presented in Table 3. The result shows that there are more left handed males than females with 58.47% left handed sons and 41.53% left handed females respectively. The result further shows that left handed fathers had more left handed daughters (6.15%) than sons (3.08%), and left handed mothers had more left handed sons (10.26%) than daughters (3.59%). This may be due to high concentration of male testosterone hormone which is also a factor for left handedness. It also revealed that left handed mothers had more left

handed off springs than did left handed fathers with a percentage of 13.85% and 9.23% respectively. McManus and Bryden (1991) reviewed 25 studies, based on 72600 offsprings relating handedness of children to parental handedness, their study revealed that left handedness is more common in males than females. Left-handed mothers had more left handed off springs than did left handed fathers, although there was no interaction with sex of the offsprings. This 'maternal effect' has been reported before in the literature (e.g. McGee and Cozad, 1980; Annett, 1985).

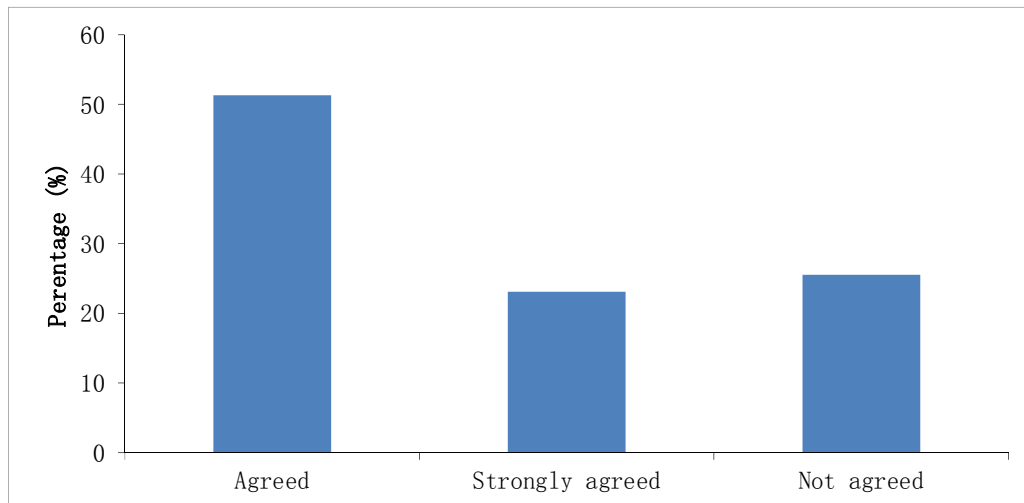


Figure 2. Respondent's perception of creativity and intelligence of left handed individuals

Left handers are believed to be creative and intelligent. About 51.3% of the respondents agreed that lefties are more creative and more intelligent than the right handers while 23.08% strongly agreed. About 25-30% did not agree with the concept. In a report by William, (1987),

it was found that on average, left-handers show lower performance in high school while other studies have established the contrary results that left-handers are significantly more intelligent than the right-handers (Faurie, Vianey-Liaud and Raymond, 2006; Ghayas and Adli, 2007).

CONCLUSION

Based on the findings of this study, it was concluded that the distribution of left handedness among students of Bayero University, Kano was remarkably low of 7.30% which is below 10% of the whole study population. It also revealed that

REFERENCES

- Annett, M. (1985). *Left, Right, Hand and Brain: The Right Shift Theory*. Erlbaum, London.
- Corballis, M. C. (1997). The genetics and evolution of handedness. *Psychol. Rev.* 105: 714–777.
- Ellis, S. J., Ellis, P. J. and Marshall, E. (1988). *Hand preference in a normal population*. *Cortex*, **14**, 157-163. Retrieved August 7, 2006, from <http://www.nature.com/nature>
- Gursoy, R. (2009). Effects of left- or right-hand preference on the success of boxers in Turkey. *Br. Journal of Sports. Med.*, 43: 142-144.
- History of BUK ".(2007) BUK.edu.ng.Bayero University Kano.Archived from [the original](http://web.archive.org/web/20071214194000/http://www.buk.edu.ng/Admin/BUK+history.htm) 12-14. <http://web.archive.org/web/20071214194000/http://www.buk.edu.ng/Admin/BUK+history.htm>. Retrieved 2007-12-29.
- Klar, A. J. S. (1996). A single locus, RGH1, specifies preference for hand utilization in humans. Cold Spring Harbor Symp. *Journal of Quant. Biology*. 61: 59–65.
- Llaurens, V., Raymond, M., and Faurie, C. (2009). *Why are some individuals left-handed? An evolutionary perspective*. Philosophical transaction of The Royal Society London B, 364, 881-894.
- Masud, Y., and Ajmal M.A. (2012). Left-handed People in a Right-handed World: A Phenomenological Study. *Pakistan Journal of Social and Clinical Psychology*, **10**(1):49-60
- McGee, M. G., (1980). Population genetic analysis of human hand preference: Evidence for generation differences, familial resemblance and maternal effects. *Behav. Genet.*, **10**: 263-275.
- McManus, I. C. (1985). Handedness, language dominance and aphasia: a genetic model. *Psychol. Med. Monogr.Suppl.* **8**, 1–40 (1985).
- McManus, I. C. (1991). The inheritance of left-handedness. *Biological Asymmetry and Handedness, Ciba Foundation Symposium*, **162**: 251-281.
- Milenkovi, S., Rock, D., Dragovi, M., and Janca, A. (2008). Season of birth and handedness in Serbian high school students. *Annals of General Psychiatry*, **7**: 2.
- Papadatou-Pastou, M., Martin, M., Munafó, M. R., and Jones, G. V. (2010). Incidence of handedness: A systematic review of laterality among 1.8M individuals. Manuscript in preparation.
- Szaflarski, J. P., Binder, J. R., Possing, E. T., McKiernan, K. A., Ward, B. D., and Hammeke, T. A. (2002). Language lateralization in left-handed and ambidextrous people: fMRI data. *Neurology*, **59**: 238-244.
- Williams, S. M. (1987). Differences in academic performance at school depending on handedness: Matter for neuropathology? *Genetic Psychology*, **148**: 469-478.

culture influences eating with right hand in left handers but not in writing. The influence of handedness of parents is more on sons by left handed mothers and more on daughters by left handed fathers.