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A Study Of Left Handedness, Hand Switching And Attitude To Sinistrality At Basic Education Schools In Kano State, Nigeria

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Abstract.
Studies showed that between 8 and 15 percent of human are lefties and the international left handers day is August 13 every year. In Nigerian some students use the left hand for doing normal tasks such as writing, drawing and many others. Parents, teachers or some individuals try to change left-handers to right-handers. Researchers have cautioned against trying to switch a left-hand child to a right-hander. Educational psychologists and other fields involved in teaching and learning have a role to play in explaining more about sinistrality and hand switching which this study addressed by raising research questions and hypotheses using survey approach. It sought the distribution of left handedness and switchers in comparison with the world estimate and examined the attitude of parents and teachers to left handedness. Multiple sampling techniques were applied to draw 180 teachers and parents, 2,576 basic school students from primary and secondary schools in kano state covering urban, rural urban and rural areas. Teachers and parents' attitude were sought using an opinionnaire tagged teachers and parents' attitude to the use of left hand (TPATLH). Descriptive statistics, one sample t and independent t tests were used to analyse data obtained. The study found that more male switchers were found than female switchers and when the switchers number were added to left handers, the world population figure of 15 percent is not significantly different from students' distribution of left handers in basic schools. Teachers are more positive in attitude to left handedness than parents and they differ significantly in attitude to left handedness. It is recommended that the Ministries and Institutes of Education should advocate and address left handers inclusiveness in the Nigerian Policy of Education as it did for others and designated units should promote and celebrate sinistrality on August 13th of every year informing the public of the advantages and disadvantages of left handedness. More values will be added to this study if researchers consider comparing academic performance of hand switchers and left handers.

Key Words: *Left handedness, Right handedness, Sinistrality, hand switchers.*

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I. Introduction

An individual's hand preference is an important factor in educational achievement and psychology which has been demonstrated to play a role in individual differences. Dextrality is preference in handedness for the right hand or more generally for the right side of the body while Sinistrality refers to people who are left-handed and more comfortable using their left hand and will probably use their left hand for tasks such as writing, personal care, cooking and others. Users of left hands are referred to as lefties, left handers, left-handed or sinistrals, while users of right hands are referred to as righties, right handers, right-handed or dextrals. Those who use both hands are ambidextrous; mixed handedness or cross dominance perform different tasks better with different hands; ambilevous or ambisinistrous have equally poor dexterity with both hands. For proper reference in this study, those who changed from the use of left hands to the right are referred to as hand switchers or switchers. Worldwide and across various disciplines it is believed that between 8 and 15 percent of the population is left-handed (Ayanniyi, 2018; Makanta et al., 2019) and about 10 percent are switchers (Nicholls et al., 2013)

MacMillan (2016) revealed that children 11 and younger left-handed kids performed worse than right-handed but the kids catch up with their classmates as they get older and that being left-handed or mixed handed is not a surefire predictor of how well kids perform as they grow up while Sharma et al. (1993) found that handedness affected both the academic and extra-curricular activities except in behavior and discipline area. Despite these and other assertions, globally we have had prominent left handers. There has been more than six left-handed US Presidents and heads of other countries like Costa Rica, Ireland, Israel, Kenya, Singapore, U.K., Mexico, Venezuela and others like Albert Einstein, Bill Gates, Oprah Winfrey, Prince Charles, Maradona, Lionel Messi, Babatunde Raji, Fashola, Danmaraya Jos, Vice President Kashim Shetima and celebrities.

In various cultures, left handedness of children and wards is being treated with disapprovals, while some cultures do not. In Africa, people see the act of using the left hand for doing normal tasks as disrespect, unclean, clumsy, evil and against some faiths. In Nigeria, most parents, teachers try to change left into right-handers. Children who attempted beginning their various skills with the left hand were discouraged in favour of the right hand (Awa, 2023; Eze, et al., 2009). The reasons varied across culture but what is paramount is the effect of using either or both of the hands especially as it pertains to overall child's school performance, health and psychological wellbeing.

Clinical psychologists, neurologists and neurodevelopmental therapists have cautioned parents against trying to switch a left-handed child to a right-handed one, saying it may lead to neurodevelopmental disorders which tends to live with the person. They noted that being left or right-handed is both natural and that every child is unique and can live a happy, fulfilling life irrespective of which hand they show a preference for. Handedness is a person's preferential use of one hand (dominant) since such a hand is stronger, faster or more dexterous in performing certain tasks. (Iremeka, 2023)

Forced use of a non-dominant hand disrupts the brain's natural thinking leading to long-term side effects such as: poor handwriting, concentration and memory issues, stuttering, constant fatigue, neurotic personality. The short-term side effects which can be warning signs of deeper-rooted issues that can become dangerous to a person's personality and everyday life include: Nail-biting, Bedwetting, Shyness or disruptive behaviour, Physical fatigue, Spelling or writing issues (Iremeka, 2023; Iwalaye, 2023)

II. Problem Statement

The prevalence of sinistrality has been increasing for over a century and the proportion of left handers is not the same in all countries (Welch, (2021); Woodley et al., 2018) while the awareness of their ability is raising concern so as to cater for their existence in the society. In Africa, people see the act of using the left hand for doing normal tasks as disrespectful. For instance, in Nigeria, it is seen as an act of disrespect for a person to greet or give another person (especially an adult) something with the left hand. In addition, most of the machineries and new technological gadgets such as cars, sewing machines, and many others, are mostly designed for right-handers which are usually the reverse for left-handers who seem not to be considered in these developments. The issue and call for inclusiveness have been key objective of African left handers organization especially in the provision of resource materials for teaching and learning.

According to available literature and experience, some children in the society who are left-handed are seen as being abnormal, evil, morose, unlucky, deficient or suffering from curable adversity and this has affected the way they interact with other children in the society, especially in relation to the school setting and invariably. This has some effects on their academic performance. (Ayanniyi, 2018; Durosayo & Dada, 2014)

In Nigeria most parent, guidance, teachers usually try to change the lefthanders into right-handers because they feel it is out of culture or a sign of disrespect. This creates a lot of difficulties for left-handers in our society in terms of their psychological, educational and social functioning. Iremeka (2023) advised that left-handed children be allowed to develop accordingly as forcing them to switch affects their emotions, learning ability, self-control and memory. Forcing a child to switch hand use preference is an unwise decision taken out of ignorance or negative attitude by parents, teachers and society. A study in Taiwan according to Ayanniyi (2018) showed that 57.3 children were forced to convert from left-handedness to right-handedness and details of the study revealed that children whose parents had less education were more likely to be forced

People forced to use their right hand as children instead of their left (switchers)are sometimes taught that symptoms are normal for their age. However, after maturing, several individuals learned that the long-term negative effects were caused by switching their dominant hands. Educational psychologists have a role to play in explaining more dextrality and sinistrality issues raised across disciplines, hence the main concern of this paper is to study the distribution of left handers, hand-switchers, attitude of parents and teachers to left handedness and the switching of left handers to right handers with a view to improving upon the level of acceptability of sinistrality for optimal performance of children in kano state schools.

III. Review of Previous Studies

Ademola (2011) reported that approximately 10 – 13% of the population is left-handed while Auwalu et al. (2022) found that 8-15% of people all over the world are said to be left-handed. Habib (2000) reported that generally, males are three times more likely to be left-handed than females. Makanta et al (2019) identified five types of handedness; Right handedness (dextrality), left handedness (sinistrality), mixed handedness (cross dominance), ambidexterity, ambilevous (ambisinistrous) and chirality. Eze et al (2009) wrote that there are three types of handedness with different prevalence rates from parts of the world including Nigerians. Out of 1,200 students he studied, all between the ages of 18 and 28, 3.94% were left-handed, 8.43% mixed handed, 87.63% right-handed. More males were left-handed. According to Nicholls et al. (2013) data showed that females were more likely to be classified as right-handed than males, but were less likely to be classified as left-

or mixed-handed. Also, more than 10% were forced to switch from left to right in their formative years. More females were forced to switch. In a wider consideration of sinistrality, Dorothy (1983) found that a left hander in one study might be classified as a mixed hander or right hander in another.

In a large-scale population study of early life factors influencing left handedness, Carolien, (2019) found that the probability of being left-handed was affected by the year and location of birth, likely due to cultural effects. In addition, hand preference was affected by birth weight, being part of a multiple birth, season of birth, breastfeeding, and sex, with each effect remaining significant after accounting for all others

Researches carried out in the Northern part of Nigeria, revealed that almost half of the respondents agreed that left-handedness is genetically determined, while most of the men in the Southern part of Nigeria believe that left-handedness develops if parents are lazy or careless in their child rearing. Women believe that left handedness occurs as a result of some medical problems during pregnancy and allow incidence of left-handedness is to be predicated in Nigeria in the areas where strong Islamic taboos operate (Durosayo and Dada 2014). Some environmental factors are 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. The contribution of genetics to handedness were supported by a number of studies involving both families of concordant twins and adopted individuals (Auwalu, et al., 2022)

Durosayo and Dada (2014) investigated the perception of secondary school students in Kogi State towards left-handedness. Using 360 male and female respondents consisting of 100 each from co-education, males and females' secondary schools, the t-test statistics revealed that there was no significant difference between male and female respondents, while there were significant differences between the respondents based on religion, age group and type of hand in their perception of attitude towards left handedness.

On health ground, lefties are at a greater risk of psychotic disorders such as Schizophrema according to 2013 Yale University study. They are also at risk of bowel problems than righties (Gupta, 2015; Macmillan, 2016). Some advantages of left handedness have been identified. Left handedness is an advantage in many sports athletics, baseball, boxing, tennis. Left handedness is common among musician, mathematician, baseball and cricket players, architects, artists etc. (Rice, 1998). They have better episodic memory; recover faster from stroke, more ideal for artistic pursuits, greater chance of being a genius.

Siebner (2002) investigated long term consequences of switching handedness by using the functional neuroanatomy of handwriting in 11 adult converted left handers and 11 age -matched right- handers and found persistent differences in the functional neuroanatomy of handwriting between right handers and converted left handers. This shows that hand switching does not transform the innate hand that is dominant and all efforts at forced switching is at the expense of the school child's mental and all-round psychological feelings in the future.

Iremeka (2023) reported that the dominant writing hand is not just a physical exercise of controlling a pen, but the way the brain is cross-wired. He explained that the brain is programmed in such a way that the left cerebrum controls the activities on the right side of the body, while the right hemisphere controls the left activities. He insisted that any alteration in this neurological arrangement has grave implications for the child's development. Neurologist advised that the idea of converting a left-hand user to a right, is wrong. The brain of a child has stored instinctual data in the right brain (Cerebrum) and has created it to work with that. So, when such an act of correction comes, it tries to disrupt intellectual order by imposing it on the child, even as the brain has programmed it.

A report by First German Consulting and Information Centre for Left-handers and Converted Left-handers, titled, 'The Primary and Secondary Consequences of Converting Handedness,' affirmed that conversion of inborn handedness, which is being carried out on the basis of societal prejudices has serious consequences, especially if one is using the non-dominant hand to write. It stated that the conversion is contrary to the natural state of the human being, noting that converting handedness does not result in the conversion of brain dominance; instead, it results in an over-loading of the non-dominant half of the brain and an under-loading of the other half. (Iremeka, 2023).

This review reveals the need to undertake more studies on the distribution of handedness, hand switchers, attitude of parents and teachers to left handedness and encourage educators to be awaken to their challenges in the schools in the area of forced change of handedness especially from the left to the right.

IV. Research Questions

The following research questions guided the study

1. What is the distribution of left handedness at basic school levels in kano state in comparison to the world estimate?
2. What is the distribution of those that switched hand from left to right at basic school levels?
3. What is the attitude of teachers and parents to left handedness?
4. What is the difference between teachers' and parents' attitude to left handedness?

V. Hypotheses

The following hypotheses were formulated for the study

1. There is no significant difference between overall world left handers mean percent population and kano state basic school left handers mean percent population
2. Teachers and parents do not differ significantly in attitude to left handedness.

VI. Methodology

Design

The Survey design used the process of instrument development and adaptation, data collections, observations, data analysis and report writing. It involved the observation of student's handedness, seeking opinion of teachers, parents and students about students sinistrality at 2 different basic levels of education across categories of environment such as urban, rural and semi urban area of the state.

Population/ Sample

The study population is made up of students, teachers and parents from kano state primary and secondary schools in Nigeria. Consent of the students, teachers, parents and school administrators were sought in view of the nature of the study. The schools were drawn from three Local Governments in the state covering Urban, Rural Urban, and rural areas. They spread across Kano municipal, Bichi and Bagwai. Primaries 1- 3 and JSS 1-3 students were involved and data were taken based on their handedness and the requirements in the instruments. The teachers of the students were involved while equal number of parents of school age categories in the environment were sought by snowballing. Hence multiple sampling techniques were used i.e., Stratified random sampling, purposive and snowball techniques. 90 streams of classes, 180 parents and teachers and 2,576 students were involved in the study with the assistance of research assistants.

Instrumentation

Structured Interview and observation schedule were used to identify student's handedness and hand switchers while teachers and parents opinionnaire (attitude scale) were used to generate attitude scores. Observation and interview schedule were developed and piloted tested by the researcher. The interview, observation schedules, and opinionnaire were validated through content validation approach. Based on a thorough study of the theories of handedness and flinders handedness survey (Flanders), the attitude instrument titled teachers and parents' attitude to the use of left hand (TPATLH) was constructed. It was reviewed, edited, content validated and pilot tested. A test rest coefficient of 0.85 was observed as reliability figure of the opinionnaire.

Data Analysis

Descriptive and inferential statistics were used with the aid of the SPSS package (V30.0.0). Opinionnaire (Attitude) scores were based on Likert rating of 4 point for Strongly Agree (SA), 3 for Agree(A), 2 for Disagree(D) and 1 for Strongly Disagree (SD). Only one item had a reversed scoring of 1 for SA and 4 for SD. The 12-item questionnaire has 48 maximum attitude scores and considering the range (48-12), the midpoint of 36 would be 18. Hence any score below 18 + 12= 30 was adjudged negative and those equal or above it would be positive. The sample t test was used to resolve data with population and sample mean percent. From the literature review the world population range of 8% to 15% was adopted and applied on one sample t test to resolve hypothesis on mean percent population and sample distribution while independent t test was used to resolve hypotheses on the difference in parent and teachers' attitude to left handedness.

VII. Results

Table 1a Distribution of left handers and Switchers of Basic School.

	Sum	Mean	Percentage
No of classes	2576.00	28.6222	1.11
Left handers (LH)	282.00	3.1333	10.95
Male Left handers (MLH)	180.00	2.0000	6.99
Female Left handers (FLH)	102.00	1.1333	3.96
Switchers (Swt)	104.00	1.1556	4.04
Male Switchers(MSwt)	76.00	0.8444	2.95
Female Switchers (FSwt)	28.00	0.3111	1.09
LH and Swt	86.00	4.2889	14.98

From table 1a above, 90 streams of classes with the population of 2,576 students had 10.95 % left handers (6.99% male and 3.96% female). 4.04% were found to be switchers (2.95% male, 1.09% female). If hand switchers were to maintain sinistrality, it is statistically necessary to add the number of left handers to the

number of switchers, therefore 14.98% of the students would be the assumed figure. To establish the significance of the descriptive data, hypotheses one is presented below.

Hypothesis One states that there is no significant difference between overall world left handers mean percent population and kano state basic school left handers mean percent population

The hypothesis is treated using the one sample t test for comparing two world left handers population figures 15 and 8 and data of student left hander in table 1b one after another. In table 1c data of student left handers and hand switchers are combined as figure of left handers.

Table 1b:
One sample t test of overall world left handers and basic school students left handers mean percent population

	N	Mean	Std. Deviation	T(15*,8**)	Df	Sig. (2- tailed)
Percent of left handers in class	90	11.1550	.33252	-4.975(*)	89	.000
				4.082(**)		.000

Table 1b shows mean percent of left-handed students in 90 classes which was used as continuous variable to estimate t for two different world population (distribution) percentage of left handers of 15 and 8 percent. From the table, the t scores are significant. t (89) = (-4.975) and t (89) = 4.082 are significant p< .05. This reveals that the hypothesis is rejected and there is significant difference between overall left handers population means and left handers population mean in basic schools. This is same for left handers population means of 8% and 15% when tested one after another in this case.

Table 1c: One sample t test of overall world left handers and combined basic School left handers and Switchers student's population.

The table combines the mean percent population figure of left handers and hand switchers for analysis in table 2b below.

	N	Mean	Std. Deviation	T(15*,8**)	Df	Sig. (2- tailed)
Percent of left handers in class	90	14.8239	8.88140	-.188(*)	89	.851
				7.289(**)		.000

Table 1c shows that for a population mean percent of 15, t(89)= -. 188 is not significant, P> .05. which means that the null hypothesis is accepted hence there is no significant difference between overall left handers population mean and mean of combined Left Handers and Switchers in basic schools. For a population mean of 8, the table reveals that t(89)= 7.289 is significant, P< .05 which means that the null hypothesis is rejected hence there is significant difference between overall left handers population mean and mean of combined LH and Switchers in kano state schools. When the distribution of left handed students and students who switched hands are put together, the sum or figure (mean percent of 14.82) is significantly comparable or similar to the world estimate of 15% left handedness in particular.

Hypotheses Two states that teachers and parents do not differ significantly in attitude to sinistrality.
This hypothesis is treated by considering the descriptive and Inferential statistics in tables 2a and b.

Table 2a: Teachers and Parents Attitude to Left Handedness.

		Attitude type		
		Negative	Positive	Total
Teacher, Parent	Parent	50	40	90
	Teacher	16	74	90
	Total (%)	66(36.7)	114(63.3)	180(100)

From table 2a, 74 teachers represent 82.2% had positive attitude to left handedness while 40 representing 44.4% of parents had positive attitude. This shows that teachers had positive attitudes to left handedness than parents. Overall, 63.3% of teachers and parents had positive attitude.

Table 2b. T test of independence on teachers and parents' attitude to sinistrality.

		N	Mean	Std. Deviation	T	Df	Sig. (2- tailed)
Item total	Parent	90	29.8667	6.14653	3.467	178	.001
	Teachers	90	32.4000	3.20393			

Table 2b reveals mean of 29.8667 and 32.4000 for parents and teachers respectively. Also, t(178)= -3.467 is significant, p< .05, hence the null hypothesis is rejected and there is a significant difference between parents and teachers' attitude to left handedness. This reflects in the attitude scores of parents and teachers.

VIII. Discussion

Male and female left-handed students are approximately 7 and 4 percent respectively distributed across the schools which showed that male left handers are more than female which agrees with studies of Eze et al. (2009), Ayanniyi (2018), Habib (2000), Nicholls et al 2013, and Iyiola, (2015). The report by Awa (2023) that parents force their children at early age to use their right hands to carry out their daily activities might have affected Nigerian girl child more in early switching of hands. Habib (2000) further observed that males are three times more likely to be left-handed that females which is different from the result of this study. More male switchers were found than female switchers and the total of 4percent found is far from the 10percent population of switchers reported by Nicholls, et al. (2013).

Figures of population of left handers in the world were found to be significantly different from the left hander's distributions in the basic schools. Further consideration to add the number of switchers to the left handers in this study suggests that the figure will seemingly represent a figure of true left handers distribution in the schools because studies revealed that most sinistrals have been converted to right handers at their early age of life. From the findings of this study the figure of left handers in basic schools would be similar significantly to world estimate if children are not forced to change hands. The basis was that if there were no switching or forced change of handedness, the left-handed distribution will change and where it did not change the functionalities are inherent and effects are at the expense of the child as implied in the study of Siebner et al. (2002). In comparison with lower and upper population range as reported by Ademola (2011) and Auwalu et al. (2022), population figure of 15 percent is not significantly different from student's distribution of sinistrality.

Teachers and parents' attitudes rating showed that teachers are more positive in attitude to left-handedness than parents both in average rating score and numerical count. The difference between their attitude score is significant. Perhaps teachers have the advantage of the knowledge about the dangers of discouraging left handedness such as those advanced by Ayanniyi (2018) or Iremeka (2023), that the brain of a left-handed child has stored instructional data in the right brain and has created to work with that.

IX. Conclusion

The study has presented the distribution of left handedness in basic schools in the light of world-wide range of sinistrality. What is sacrosanct is that in schools observed, the distribution of left handers does not reflect the true genetically endowed lefthanders, however stoppage of hand switching and forcing children to change from the left to the right will significantly reflect similar distribution with the world distribution figures. Observable figures of left handers are therefore short of the realities in the basic schools.

The Parent in particular, the society, religious beliefs and teachers are the focal factors in the revelation of this study on attitudes towards hand switching rather than the students. These focal factors work inseparably with the child as a subject under parents and religious leaders' instructions. Children have no opportunity to do otherwise at earlier stage of life which is the time of hand switching. The negative attitude observed from the society, religious belief and parents require some therapy so that every child will attain optimal performance and escape health and psychological effects of hand switching. It is apparent that now, and in the future, forcing children to switch hands would be viewed from the perspective of injustice, cultural barbarism and unacceptable practice.

X. Recommendation

The comparative gap observed in the distribution of left handers in schools require prompt attention and these recommendations will go a long way in helping children and those yet unborn.

The Ministries and Institutes of Education should address hand switching in the policy of education as it did for other inclusive education.

Ministries and institutes of education should create units in all its establishments to promote the understanding of inclusiveness of left handedness, encourage sinistrality and advocate the right to be a lefty.

Units designated to promote sinistrality may use August 13th and other days to do impactful programmes that will celebrate sinistrality and inform the public of the advantages and disadvantages of left handedness in vulnerable areas in the society.

The Government should work with the International and National bodies of the Lefthanded, traditional rulers, religious leaders, NGOs to educate the public especially the educationally disadvantaged areas on the needlessness and implications of forcing children to switch hands from left to the right

XI. Further Research

Researches are encouraged to progress deeper into studies on sinistrality noting the assertion of Welch (2021) that it is an unending study area which can be complex and at times controversial. The following areas are suggested for value addition in the field of educational psychology, evaluation and counselling:

Comparing academic performance of switchers and left handers

Construction of hand switching survey instruments

Reversing hand switchers back to sinistrality and the implications.

Identifying and improving the ambilevous in school system

References

[1]. Ademola, O., Kofoworola, O., Omotayo, O., Bassey R, Dolapo, D., & Edidiong, A. (2011). The Prevalence Of Left-Handedness Among Medical And Dental Students In The University Of Lagos Nigeria. Middle-East Journal Of Scientific Research ,8 (1), 288-293.

[2]. Adeoye, E.A., & Dada, M.F.(2000). Causes Of And Problems Associated With Left-Handedness As Perceived By Medical And Non-Medical Students At University Of Ilorin. Ilorin Journal Of Education, 1-13.

[3]. Auwalu, S. A., Ibrahim, S. & Abdullahi I. L. (2022). Prevalence Of Left Handedness Among Students Of Bayero University, Kano. Bayero Journal Of Pure And Applied Sciences, 13(1): 129 – 133.Http://Dx.Doi.Org/10.4314/Bajopas.V13i1.23S

[4]. Ayanniyi, B.A. (2018). Left-Handedness And Stigmatization In Africa: Implication For Parents And Teachers. Global Journal Of Archaeology & Anthropology. 7(3). 555713. DOI: 10.19080/GJAA.2018.07

[5]. Awa, O. (2023, September 2). Use Of The Left Hand: Between Myths Misconceptions And Reality. The Guardian. Https://Guardian.Ng/Saturday-Magazine

[6]. Bishop, M. N. D. (1983). How Sinister Is Sinistrality? Journal Of The Royal College Of Physicians Of London. 17(3):161-165, 168-172

[7]. Carolien G.F., Kovel D., Castilo A.& Francks C. (2019). A Large Scale Population Study Of Early Life Factors Influencing Left Handedness Retrieved from Https://Wcww.Researchgate.Net/Publication/330591763_A_Largescale_Population_Study_Of_Early_Life_Factors_Influencingleft handednes S/Fulltext/5c526a7c92851c22a39d3453/330591763

[8]. Durosaro I. A. & Dada M. F. (2014). Attitude Towards Left-Handedness As Perceived By Selected Secondary School Students In Kogi State. Http:// Www.Journals.Ui.Edu.Ng

[9]. Eze, J.N., Obikili, E.N., Ezepue, U.F., Ozoemena, O.F.N., & Esom, E.A. (2009). Patterns Of Handedness And Socio-Cultural Influences On Dextrality Amongst University Of Nigeria Medical Students. Journal Of Experimental And Clinical Anatomy, 8, 2. Retrieved Fromhttp:// Www. Ajol.Info/ Index.Php/Jeca/Article/View/55646.

[10]. Gupta, S. (2015). 20 Ways Being Left Handed Impacts Your Health. Http://Edition.Cnn.Com/2015/11/03/Health/Being-Left-Handed-Health-Impact/

[11]. Habib, M. (2000). Left-Handedness: Does It Mean Anything? Retrieved From Https://Www.Psych Ologistworld.Com/Influence Personality/Han Dedness.Php

[12]. Iremeka, C. (2023, July 2). Switching Left-Handed Children To Right Confuses Brain Functionalities – Neurologists. Punch Newspaper.

[13]. Iwalaiye, T. (2023, August 13). 10 Dangerous Consequences Of Switching From Left-Handedness To The Right Hand. Pulse Newspaper.

[14]. Iyiola1, O. A., Anifowoshe1, A. T. & Oyeyemi, B. F. (2015). Incidence And Prevalence Of Left Handedness In A Nigerian Sub-Population. Ilorin Journal Of Science. 2, 2, 441 – 454 Https://Doi.Org/10.54908/Iljs.2015.02.02.013

[15]. Macmillan, A. (2016). 20 Little-Known Facts About Being Left-Handed. The Secret Perks And Pitfalls Of Being A Southpaw. Retrieved From Http://Www.Health.Com/Health/Gallery/0,,209 61805,00.Html

[16]. Makanta, M. Y.; Gana, I. U. & Chado, S.S. (2019). Linking Theories Of Handedness With The Use Of Dominant Hand In Society: Stigmatization And Psychological Implications. International Journal Of African Sustainable Development. Vol. 11 No. 2 ISSN: 0081 – 3998

[17]. Nicholls, M.E.R, Thomas, N.A., Loetscher, T. & Grimshaw, T.G. (2013). The Flinders Handedness Survey (Flanders): A Brief Measure Of Skilled Hand Preference. Http://Dx.Doi.Org/ 10.1016/J.Cortex.2013.02.002

[18]. Rice, P. F. (1998). Human Development (3rd Ed.). Prentice Hall.

[19]. Sharma, R.B., Goyal, M., & Singh, J. (1993). Comparison Of Scholastic Performances Of Left Handed And Right Handed Students. Indian Pediatrics, 30,10, 1189-1192. Retrieved From Http://Cat.Inist.Fr/?Amodele=Affichen&Cpsidt=4041085

[20]. Siebner, R. H.; Limmer, C.; Alexander Peinemann, A.; Drzezga, A.; Bloem, R.B., Schwaiger, M.; & Conrad, B.(2002). Long-Term Consequences Of Switching Handedness: A Positron Emission Tomography Study On Handwriting In "Converted" Left-Handers. Https://Pmc.Ncbi.Nlm.Nih. Gov/Articles/PMC6758284/

[21]. Welch, J. (2021). Survey Of Handedness. Journal Of American Society Of Questioned Document Examiners. 24(2). 25-28.

[22]. Woodley, M.A., Fernandes, B.F., Kanazawa, S., & Dutton, E. (2018). Sinistrality Is Associated With (Slightly) Lower General Intelligence: A Data Synthesis And Consideration Of The Secular Trend In Handedness. Sciencedirect 69(3) 118-126 Https://Doi.Org/10.1016/J.Jchb. 2018.06.003

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