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EFFECTS OF HANDEDNESS AND GENDER ON CREATIVITY OF STUDENTS

ABSTRACT

The present study aimed at exploring the effect of handedness on creativity level of students. Furthermore, this study also intended to find out gender differences in creativity level of students. The sample of this study comprised of 160 students with equal number of left and right handers (n = 80). Each category of handedness included 40 girls and 40 boys. The participants of the study were students of 8th to 10th grades who were purposively selected from various English Medium Schools of Sargodha city. Edinburgh Handedness Questionnaire (Oldfield, 1971) was used to determine the handedness of students. The Abbreviated Version of Wallach Kogan Creativity Test (Riaz, 1978) was administered to measure the creativity level of left and right handed students. Results of this study indicated that left handed students were significantly more creative than their right handed counterparts. Moreover, girls were also found to be significantly more creative than the boys. Limitations of this study and suggestions for future studies have also been discussed.

Key Words: Creativity, handedness, gender

INTRODUCTION

Handedness is the hand preference patterns that are regarded as an index of individual differences in the cognitive performance (Raj, 2003). Handedness is an attribute defined by unequal distribution of fine motor skills between the left and right hands. According to Hardyck and Petrinovich (1977), an individual who is more dexterous with the right hand is called right handed, and one who is more skilled with the left is said to be left-handed .A minority of people is equally skilled with both hands, this is termed as ambidextrous. Children who are ambidextrous use either hand with the same ease (Bryner, 2010).

Creativity is the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others (Franken, 1998). Cropley (1999) listed the universal factor for creativity to be novelty. Novelty requires originality and newness.

Handedness has been assumed to have some relationship with the creativity (Stewart & Clayson, 1980) as left handers tend to be higher on intellectual (Ghayas & Adil, 2007) and creative abilities. According to Stewart and Clayson (1980), left-handed individuals

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may have a slight advantage with spatial-holistic tasks and it makes them more creative individual especially in nonlinguistic pursuits.

Recent research also supports a relationship between creativity and handedeness. Norton (2000), for instance, has gathered new evidence on the link between left handedness and intellectual creativity. He suggested that true left handers tend to be more intelligent and eloquent than right handers, and better at solving problems. The recent and perhaps the most sophisticated evidence for the relationship between creativity and handedness stems from neurological research which reveals that creativity is linked with the brain activity. Evidence from brain images, drug studies and lesion analysis has revealed that creativity is a result of interaction between frontal lobe, the temporal lobes, and dopamine in the limbic system (Flaherty, 2005). The right hemisphere has been found to be more involved in creativity as it appears to be more active in novel problem solving and generating new ideas as compared to the left hemisphere (Atherton & Zhuang, 2003). In the same vein, Gailcalled (2003) found that brain of left-handers can be more flexible in its distribution of functions, allowing one function to be proximal to different functions than they would be in a right hander's brain. Keeping in view the brain lateralization, the present study is legitimate in hypothesizing that the left handers would be more creative than the right handers.

As far as the role of gender in creativity is concerned, pertinent literature offers empirical evidence for the gender differences in creativity but the results have been contradictory. Kershner and Ledger (1985), for example, reported that girls have more creative abilities as compared to boys. Raina (1970) observed that girls scored higher than boys on all the dimensions of creativity except originality, but these differences were not significant. Contrary to that, Kelly (1965) conducted a study on high school students and revealed that boy scored higher than girls on non-verbal creativity measures. Straus and Straus (1968) reported that boys perform better than girls on measures of creativity in both Indian and American culture, while sex differences were more prominent in India.

According to Vernon (1989) social-environmental influences couldn't be the only causes of different patterns of creative achievement by men and women and that genetic factor may also play a role. Simonton (1994) countered that active discrimination against women had often made it difficult or impossible for women to have access to the resources necessary for achievement in some fields. Thus, a woman might more easily succeed in a field like writing, where the necessary resources are few, than in musical composition or science, where lack of access to an orchestra or a well equipped laboratory might make it far less likely that a woman could participate. Such differences in access to resources, together with societal views toward success by women and men in a given place at a given time, might account for the unequal ratios of men and women who have had creative success in different fields. This line of reasoning has empirically been supported as Kaufman and Bear (2005) studied more than 2,400 men and women, each of whom rated their own creativity in 56 different areas. Men self-reported higher levels of creativity in such areas as mechanical abilities, physics, and sports strategy (and many other stereotypically boys activities), and women self-reported higher levels of

creativity in such domains as interacting/communicating with children, teaching, and interior design/decorating (and many other stereotypically girls interests). In lieu with the inconclusive results pertaining to gender differences in creativity, as evident in the aforementioned literature, the present study hypothesized that girls would be more creative as compared to the boys.

METHOD

Objectives and Hypotheses

The primary objective of the present study was to find out the relationship between handedness and creativity among students. In this regard, the study hypothesized that left-handed students would be more creative as compared to their right-handed counterparts. The second objective of this study was to discern gender differences in creativity of students. This study tested the hypothesis that girls would be more creative as compared to boys to achieve the second objective.

Sample

A convenient sample of 160 students *(N* = 160) with an equal number of left handed and right handed students *(n* = 80) was drawn from various private sector English medium schools of Sargodha city. The age range of the sample was 13 to 16 years *(M* = 14.5, *SD* = 16.1) and it included both the genders in equal proportion (40 students of each gender in each category of handedness). The educational level of the sample ranged from middle to matriculation. The detailed breakdown of the sample in terms of demographics is given in Table 1.

Table 1

Demographics of the Participants (N = 160)

Gender	Education	Handedness	
		Left-handed	Right-handed
Boys	8th Grade	15	13
	9th Grade	14	18
	10th Grade	11	9
Girls	8th Grade	14	12
	9th Grade	19	17
	10th Grade	7	11

Instruments

Edinburgh Handedness Inventory (Oldfield, 1971) was administered to identify the left and right handers. It consists of 10 items and the answers are given in the 2 columns with reference to the preference of the hand and the use of the other hand. The score below -40 indicates left handedness. The score between -40 and +40 indicates the ambidextrous. The score above +40 present the right handedness. The internal consistency (coefficient

alpha) of Edinburgh Handedness Inventory alpha was .93 and the test-retest reliability of the questionnaires is .80 (Stephen, 1991).

The Abbreviated Version of Wallach-Kogan (1965) test of creativity (AVWKCT) (Riaz, 1978) was used to measure creativity. The test consists of twelve items, having three categories, instances, alternative uses and line and pattern meaning. First two categories were verbal and last four items were having drawing on the cards. There are two measures of creativity in this test (Riaz, 1978). The scale has been scored on two dimensions including fluency and uniqueness. All the items were verbal. The items are open ended and respondents are at liberty to express their imagination without any restriction. The inter scorer reliability of test of creativity is calculated and a standardized scoring system is adapted. All the responses on item were calculated as fluency of the participant and unique answers at each question was analyzed as uniqueness of that participant. The total creativity score of the participant was obtained by summing his/her fluency and uniqueness scores.

Procedure

The participants of the study were personally contacted in their respective schools after getting official permission from the principals. The principals were assured of the confidentiality of the information that their students were going to provide as these information were only used for the research purpose. All the students were briefed about the instructions and objectives of the study and their informed consent was ensured. The booklets containing the aforementioned instruments were handed over to the students along with oral as well as written instructions in individual settings. The average time for the scales administration was 34 minutes with a standard deviation of 6.87 minutes. All the responses were recorded on the sheets of paper. At the end, the participants were apprized for their cooperation and support in the study.

Results and Discussion

The present study was intended to find out the effect of handedness and gender on the creativity level of the students. In order to determine the differences in the creativity level of the participants, t-test was applied on the scores of left and right-handed students.

The value of t indicates significant differences in the creativity level of left and right handers $\{t\ (158) = 4.45, p < .01\}$ providing an empirical support for the hypothesis of the present study that left handers would be significantly more creative than the right handers (see Table 2).

Table 2

Effect of Handedness on Creativity in Students (N = 160)

Groups	*n*	*M*	*SD*	*t*	*p*
Left Handers	80	83.00	41.813	4.45	.00
Right Handers	80	51.50	27.610		

df = 158

These results are supported by the previous research which compared left and right handed participants on four subtests of the Torrance Creativity Test. At each age level, left handed students showed higher creativity scores than right handed students. The greatest differences were found on the Elaboration subtest (Stewart & Clayson, 1980).

An indirect support for the hypothesized relationship between creativity and handedness can be presented in terms of the positive relationship between intelligence and creativity. Sternberg (2001) argued that intelligence is directly related to creativity as intelligence helps to create and generate new ideas. Rawat and Agarwal (1977) found a significant relationship between creativity and intelligence. They found high achievers on the tests of intelligence scored high on test of creativity also. Handedness appeared to be an important factor in intelligence as well. Ghayas and Adil (2007), for instance, found that left handers were significantly more intelligent as compared to right handers. In the same vein, Searleman (1998) conducted a study on memory, vocabulary and problem solving. Results of his study revealed that people who were true left-handers (who did everything on their left side) scored one-third more highly on vocabulary tests and twice as well on problem-solving tasks. The research also found that left handed people are intellectually more gifted with IQs over 140. The right handed students made more errors than did the left handed students (Peterson & Lansky, 1977). Thus it can be deduced that intelligence might have mediated the relationship between creativity and handedness.

Scores of the students on the Abbreviated Version of Wallach-Kogan creativity test was analyzed in terms of gender. t-test was used to analyze the difference of creativity level between boys and girls. Value of t indicates that there is significant difference in creativity level of the boys and girls $\{t\ (158) = 2.191\ ,^{*}\ p < .05\ \}$. Hence, the second hypothesis of the present study was also supported as girls were significantly more creative as compared to the boys (see Table 3).

Table 3

Gender Differences in Creativity of Students (N = 160)

Groups	*n*	*M*	*SD*	*t*	*p*
Girls	80	75.56	46.18	2.19	.03
Boys	80	58.94	27.25		

df = 158

This finding is in tune with the previous research as Kershner and Ledger (1985) reported that girls have more creative abilities than boys. They suggested that girls

scored higher than boys consistently across the 7 creativity subscales. Similarly, Stephen, Karnes and Whorton (2001) found that girls obtained higher scores than boys across all subtests with significant differences in Originality and Creative Index scores.

The finding can be explained in terms of neurological differences acroos the two genders. The number of brain cells which connect the right and left side of brain is four times higher in women as compared to men. Men rely easily and more heavily on their left brain to solve one problem one step at a time. Women, on the other hand, have more efficient access to both sides of their brain and therefore they can focus on more than one problem at one time and frequently prefer to solve problems through multiple activities at a time (Conner, 1999). Since the present research in consonance with the pertinent literature has found that right hemisphere is more involved in creativity, men's lower score on creativity was the expected outcome given their more reliance on left hemisphere and sequential approach to problem solving.

Limitations and Suggestions for Future Research

The present study has revealed a significant positive relationship between left handedness and creativity which appears to be counter intuitive given our cultural beliefs about the supremacy of right handedness and the value and efforts we put in teaching our children to be right handers. However, the cross-sectional design of the study does not allow us to make any causal inferences about the effect of handedness and creativity. The reliance on self-report, cross-sectional, perceptual measures constitutes another limitation of the present study. Self-report measures pose a threat of inflating the observed relationships spuriously on account of common method variance as an alternative explanation for the findings. The study also entails certain limitations in terms of its sample as it was limited to students of middle to secondary classes from English medium private sector schools. Consequently, the sample may not be a true representative of its corresponding population.

The future research should investigate the role of intelligence as mediator of the relationship between creativity and handedness. Moreover, longitudinal designs should be employed to allow the causal interpretation of the hypothesized relationships. Neurological research can go a long way in disentangling the intricacies of relationship between handedness and creativity by providing not only the most conclusive evidence for the relationship of handedness and creativity but also the most plausible explanation for this relationship.

Conclusion

The present study corroborates the relative contribution of gender and handedness in relation to creativity suggesting the neurological differences in terms of brain lateralization and synoptic differences across the genders. The insight provided by the present study offers certain implications for our society which is primarily right handed dominated and where the creative endeavors of women are mostly undermined. A growing number of researchers have called for changes in the paradigm of how we view

women and creativity, and the need for changes in the society that could facilitate the development of women. Women have made and continue to make, many creative contribution that are different from the creative accomplishments made by men, yet men's creative accomplishments seemed to be valued by the society. The creative accomplishments of women are regarded by them as more modest, and do not reflect the types of creative productivity that results in awards, prizes, books, articles, art, patents, professional stature and financial gain (Reis, 1987; 1995; 1996; 1998). Nevertheless, the creativity of women is indispensible for the overall growth and prosperity of society.

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