Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Annals of Biological Research, 2012, 3 (6):3009-3014
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library
ISSN 0976-1233
CODEN (USA): ABRNBW

Lateral Preference and Emotional Intelligence

Hengameh Alibeik[1], S. Abdolhamid Angaji[2*], Sara Poriamanesh[2] and Fariba Hasani[3]

[1]Department of Biology, North Tehran Branch, Islamic Azad University, Tehran, Iran
[2]Department of Biology, Kharazmi University, Tehran, Iran
[3]Department of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran

---

ABSTRACT

Handedness or other sidedness, such as footdedness and eyedness, are not neutral and some costs are associated with left sidedness. The most frequency cited costs are a reduced longevity, a smaller height and weight, late puberty and a larger developmental instability. The persistence of the polymorphism of handedness is interesting and suggests that left-handedness must be associated with some benefits. In humans has been proposed that it is maintained by negative frequency-dependent selection. In the present research, we have focused on emotional Intelligence (EI) measured as Emotional intelligence Quotient (EQ) as a possible advantage involved in human left-sidedness. The crossed left footer seem to be more advantageous for emotional intelligence. The results that were found in the present research in relation to EQ confirmed the working hypothesis in essence but are inconsistent with the previous findings related to Intelligence Quotient (IQ). That led us to the statement that these two variables make separate and discrete contributions to performance and achievements of individuals with a left side preference.

Keywords: Population genetics, emotional intelligence, intelligent quotient, handedness

---

INTRODUCTION

As a population, humans show lateralization, about 90 per cent of adults being right handed, around 80 per cent being right footed, about 70 percent being right eyed, and about 60 percent being right eared by preferences [17]. People who do not have a dominant hand are said to be crossed dominant. Crossed dominance also refers to a condition where the person's dominant eye, ear, foot, or hand is not on the same side. The figures imply that at least 20% of the population will prefer to use one hand and the other eye. Between 1.5% and 6% of right handed adults appear to prefer their left foot. The prevalence of crossed lateral preference is higher in left handed individuals, in whom between 20% and 50% prefer their right foot (Lorin *et al*.,1998). Many theorists, particularly in the area of education, have focused on this phenomenon [7]. Hand preference has been shown in many studies to run in families, the offspring of two left handed parents, being more likely to be left handed than the offspring of two right-handed parents, [3, 15]. Similarly, there are data in the literature suggesting that eyedness runs in families [25] and that footedness shows familial trends [17]. Hand preference is the most studied form of lateralization. Left-handers have coexisted with right handers at least since the Upper Paleolithic and left-handers are in the minority in all human populations. Handedness is not neutral and some costs are associated with left handedness. The most frequency cited costs are a reduced longevity, a smaller height and weight, late puberty and a larger developmental instability. The persistence of the polymorphism of handedness is interesting and suggests that left-handedness must

be associated with some benefits. In humans has been proposed that it is maintained by negative frequency-dependent selection (advantage being greater when the frequency of a trait is lower) [6, 14, 22]. The frequency-dependent advantage of left-handers in physical fights is strongly suggested by both the study of interactive sports in industrialized societies and a cross-cultural comparison of traditional societies. In western societies, Left-handers are supposed to have a socio-economic status advantage. Brain structures and functions are certainly linked to social and intellectual skills, on which socio-economic status depends [9, 10, 11]. The frequency-dependent superiority of left-handers would confer them fitness advantages. It could have historically influenced survival, but also social status and reproductive success [6].

In the present research, we have focused on EI measured as EQ as a possible advantage involved in human left-sidedness. Although definitions of EI vary widely, it can be thought of as "the set of abilities (verbal and non-verbal) that enable a person to generate, recognize, express, understand, and evaluate their own and others' emotions in order to guide thinking and action that successfully cope with environmental demands and pressures". Bar-On considers emotional intelligence and cognitive intelligence to contribute equally to a person's general intelligence, which then offers an indication of one's potential to succeed in life [4,5]. According to Goleman(1998) whereas IQ accounts for 20 percent of success on the job, EQ was shown to account for 80 percent. Viriyavidhayavongs (2000) demonstrated that EQ and its various factors are significantly correlated with leadership effectiveness and that more successful managers and those occupying higher positions had higher levels of EQ [12, 23]We have recently provided a correlation between a traditional type of IQ and sidedness in a group of left handed population. Subjects who were left-handed but preferred their right foot and right eye had significantly higher IQ than other groups [2]. In the present study, we tried to test the following hypotheses:

Because the right hemisphere of brain is related to emotional perception or output, individuals with a left side preference should score higher on emotional intelligence than participants who prefer to use the right side of their body. Such a superior EQ could be considered as a fitness advantage for the persistence of left sidedness frequency in human evolutionary pathway.

To improve our understanding of above mentioned hypotheses, the following items related to EQ were studied:

1. The pair wise comparisons of participants with 'crossed' and "uncrossed" lateral preferences as two-organ groups
2. The pair wise comparisons of subjects with 'crossed' and "uncrossed" lateral preferences as three-organ
3. Influence of gender and familial sinistrality as major factors involved in human left- sidedness.
4. Determination of interrelationships between EQ and IQ correlated to human left- handedness.

MATERIALS AND METHODS

The research sample comprised of three hundred and sixty four subjects (N=362), 81 males and 281 females. They ranged in age from 18-26 years. The subjects were healthy, devoid of neurological or psychiatric signs and symptoms.

The data was collected with the help of following measures.
a) Side preference assessment
b) Emotional Quotient Inventory

a) Side Preference Assessment
To assess the hand preference, the subjects received a Persian translation of the Edinburgh handedness questionnaire [16]. It consists of 20 items describing different hand motor activities.

On the response sheet, each item was followed columns labeled left and right. Every subject was required to mark "+" in the appropriate column if the activity was preferentially carried out using one hand, a "++" if no way the other hand would be used unless in a forced situation, and "+" in both columns in case of real indifference on which hand to use. A laterality score was calculated (Geschwind score, GS) instead of a laterality quotient. GS of -100 indicated that the subject responded "always left

". The GS of +100 indicated always right on all items.

Eyedness was assessed by three items: eye used for looking into a dark bottle and eye used for looking through a hole and eye used for looking through a camera lens.

Footedness was appraised by three items: kicking a ball, picking up a pebble and stepping a chair.

b) Emotional Quotient Inventory

EQ-i is designed to assess the emotional intelligence. EQ-I is an inventory based on Bar-on Model of emotional Intelligence and is copy right material of Multi Health System (MHS). It contains 117 items distributed into 15 subscales of EQ-i. The WQ-I have five point self rating response format. 55 items were positively scored items and 62 items were negatively scored. Positively scored items will score 1 for the first choice i.e. "very seldom or not true of me", 2 for the second choice " seldom true of me", 3 for third choice "sometimes true of me", 4 for the fourth choice "often true of me", and 5 for the fifth choice" very often true of me or true of me". Negatively scored items will get score 5 for the first choice, 4 for the second choice, 3 for the third choice, 2 for the fourth choice and 1 for the fifth choice. In this way all the negatively scored items were scored inversely [4, 5].

RESULTS

At first, the EQ of 362 students were assessed and classified into ten groups with sixth group having the highest frequency (Figure 1). The overall mean was around 324.27, with a standard deviation about 34.354. The trait seems to vary continuously among students and the distribution of the character cannot be distinct into discrete phenotypic classes, suggesting that the trait is polygenic or quantitatively inherited.

In figure 1, elongated tail is at the left side of the graph and more data is in the left side than would be expected in a normal distribution, i.e. , the data is negatively skewed, with skewness value of around -0.26 which is considered slightly skewed since it is between 0 to -0.5.

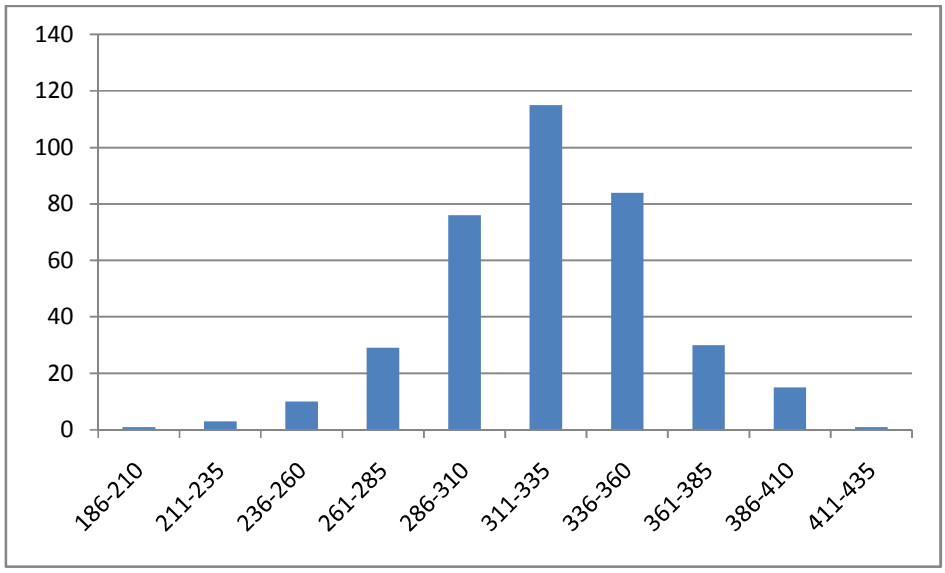

Figure 1. Frequency of EQ for 362 students ranged in age from 18-26 years.

Group Comparisons

Comparison Based on Two Organs

So as to find significant difference among the subjects, the population was classified into 12 groups based on two of three organs including hand, foot and eye. The significant results (Table 1, 2 and 3) at five percent and one percent are as follows:

Table 1: t test for EQ between those with left preference for hand and eye and the subjects with right preference for eye and left preference for hand.

Handedness and Eyedness	*N*	*Mean*	**t**
Left hand & left eye	152	326.0855	*
Left hand & Right eye	42	313.3333	

*df=192, * p< .05*

Table 2: t test for EQ between left handed and right eyed students and those with right preference for the two organs.

Handedness and Eyedness	N	Mean	t
Left hand & Right eye	42	313.3333	*
Right hand & Right eye	98	326.8776	

*df=138, * p< .05*

Table 3: t test for EQ between those who prefer left side for hand and foot with right handed and left footed students.

Handedness and Footedness	N	Mean	t
Left hand & Left leg	160	321.6500	**
Right hand & Left leg	3	342.000	

*df=161, ** p< .1*

Comparisons Based on Three Organs:

With the purpose of looking for significant difference amongst the students, they were divided into eight groups based on three organs including hand, foot and eye. The following results (Table 4, 5, 6, 7 and 8) are significant.

Table 4: t test for EQ between those who prefer right side for the three organs with left handed, left footed and right eyed individuals.

Handedness and Footedness & Eyednessa	N	Mean	t
Right hand & Right foot & Right eye	90	326.3000	*
Left hand & Left foot & Right eye	29	312.1034	

*df=117, * p< .05*

Table 5: t test for EQ between right handed, right footed and left eyed students with right handed, left footed and right eyed ones.

Handedness and Footedness & Eyednessa	N	Mean	t
Right hand & Right foot & Left eye	27	320.5556	*
Right hand & Left foot & Right eye	2	348.5000	

*df=27, * p< .05*

Table 6: t test for EQ between right handed, left footed and right eyed subjects with left handed, left footed and right eyed ones.

Handedness and Footedness & Eyednessa	N	Mean	t
Right hand & Left foot & Right eye	2	348.5000	*
Left hand & Left foot & Right eye	29	312.1034	

*df=29, * p< .05*

Table 7: t test for EQ between left handed, left footed and right eyed individuals with left handed, right footed and left eyed ones.

Handedness and Footedness & Eyednessa	N	Mean	t
Left hand & Left foot & Right eye	29	312.1034	*
Left hand & Right foot & Left eye	28	332.3929	

*df=55, * p< .05*

Table 8: t test for EQ between right handed, left footed and right eyed subjects with left handed, right footed and right eyed ones.

Handedness and Footedness & Eyednessa	N	Mean	t
Right hand & Left foot & Right eye	2	348.5000	*
Left hand & Right foot & Right eye	12	314.0833	

*df=12, * p< .05*

DISCUSSION

In the present experiment was attempted to search around evolutionary forces involved in human sidedness. It was proposed, the persons with crossed and uncrossed left preferences, depend on their distinct organization of the brain, have more emotional intelligence than individuals who prefer to use the right side of their body. This selective advantage might help them to persist and keep their frequency in human evolutionary pathway.

First, it was asked whether left sided preferences were related to emotional intelligence. This was the case in the present study. After assessment of hand preference by Edinburgh Handedness Questionnaire [16] to measure emotional intelligence the Persian translation of one of the oldest and most validated assessments called EQ-I developed by Reuven Bar-On (1997) was used. It is a self-report measure of fifteen different factors divided among five realms that Bar On has delineated to define Emotional Intelligence [4].

The results derived from two-organ comparisons showed a significant difference between left handed right eyed individuals and subjects who were uncrossed left sided and uncrossed right sided for these two organs. It was also possible to demonstrate that right handed, left footed subjects had significantly higher EQs than those who were uncrossed left sided for these organs. Since in comparisons of three organ groups, the right handed, right eyed but left footed participants was found to be advantageous for having highest EQ scores it seems that this group has the most suitable combination related to the mentioned hypothesis.

A tremendous amount of experimental work has attempted to identify reliable behavioral predictors of cerebral lateralization. Preferred handedness has been the most popular predicator, but Lorin (1998) suggested preferred foot may serve as a more accurate predictor of laterality which was confirmed by our findings. On the other hand, the present study which demonstrates the highest scores belong to crossed left footer are not congruent with our previous report related to IQ which demonstrated the highest scores belonged to crossed left hander [2].

Second, it was asked whether an association between emotional intelligence and left sidedness could be considered as an advantage factor for maintenance of left handed frequency for thousands of years. We will look at it as an indirect confirmation. After Darwin's early work on the importance of emotional expression for survival and second adaptation [5], many other studies reported the relationship between emotional intelligence and succeed in life, personal adjustment, leadership effectiveness and job performance [8, 23] .According to Pool (1997), IQ predicts only about 20 percent of career successes, which leave the remaining 80 percent to other factors such as emotional intelligence [18]. Therefore having superior EQ may be considered as an evolutionary advantage for left sided individuals that leads to career success, more income and better socio economic status.

Two effects that we found are also worth noting. First, no significantly differences were showed between genders in none of the compared groups in this experiment. Previous studies reported by King (1999), Sutarso (1999), Wing and Love (2001) and Singh (2002) revealed that females have higher emotional intelligence than that of males [13, 16, 19, 20, 24] and according Ahmad and colleagues (2009) males have higher emotional intelligence as compare to female [1].

Second, in order to familial sinistrality (FS+), this research has shown a significantly higher mean EQ for females who were strong uncrossed left sided (Geschwind scores-85 to -100) with a familial sinistrality (FS+) than females without familial sinistrality(FS-). This finding is in contrast to IQ results which demonstrated females with familial sinistrality (FS+) had IQs below normal [21]. With other words the familial sinistrality which is related to degree of left sidedness might have an influence on both EQ and IQ results but not by the same way.

CONCLUSION

We planned to explore relationships between left sidedness and emotional intelligence as a selective advantage for persistence of left sided frequency in human evolutionary pathway. The crossed left footer seem to be more advantageous for emotional intelligence. The results that were found in the present research in relation to EQ confirmed the working hypothesis in essence but are inconsistent with the previous findings related to IQ. That led us to the statement that these two variables make separate and discrete contributions to performance and achievements of individuals with a left side preference. Our findings suggest being crossed dominant might possess more selective advantage than uncrossed left sided or uncrossed right sided related to both IQ and EQ. However, it doesn't explain the persistence of strong left sided individuals who prefer the left side of their body for all their motor activities and functions.

REFERENCES

[1] S Ahmad; H Bangash; SA Khan . *Sarhad J.Agric*.**2009**, 25(1): 127-130.
[2] H Alibeik ; SA Angaji; S Pouriamanesh; G Movallali. *Australian Journal of Basic and Applied Sciences*, **2011**, 5(6): 1517-1524.
[3] M Annett. left,right,hand and brain:the right shift theory. London: Erlbaum, **1985**, 474p.
[4] R Bar-On. The Emotional Quotient Inventory (EQ – i): Technical Manual. Toronto: Multi – Health Systems, **1997**.
[5] R Bar-On. The Bar-On model of emotional-social intelligence (ESI). Psicothema, 18 , supl. **2006**,13-25.
[6] S Billiard; C. Faurie; M Raymond. *Journal of Theoretical Biology*, **2005**, 235: 85-93.
[7] DC Bourassa; IC MacManus; MP Bryden. Handedness and eye dominance: A meta- analysis of their relationship, laterality, **1996**, 1(1):5-34.
[8] R Cooper; A Sawaf. Executive EQ: Emotional Intelligence in Business. London,Orion. **1997**, 358p.
[9] P Dunn. The impact of starting a new venture on the entrepreneur and their family: Expectations, reality, and willingness to start again. Presented at the Association for Small Business and Entrepreneurship Annual Conf. **2002**.
[10] LJ Elias; MP Bryden; MB Bulman. *Neuropsychologia*, **1998**, 36(1): 37-43.
[11] C Faurie; S Bonenfant; M Goldberg; S Hercberg; M Zins; M Raymond. *Br. J. Psychol*., **2008**, 99: 533-554.
[12] D Goleman. Working with Emotional intelligence. NY: Bantam Books, **1998**, 383p.
[13] M King. *Dissert. Abst. Int.* **1999**, 60(3): 606.
[14] V Llaurens; M Raymond; C Faurie. *Phil. Trans. R. Soc. London* B. **2009**, 364: 881-894.
[15] IC McManus. The inheritance of left-handedness. Biological asymmetry and handedness Ciba foundation Symposium, London, **1991**, 162: 251-267.
[16] RC Oldfield. *Neuropsychology*, **1971**, 9: 97-113.
[17] C Porac; S Coren. Lateral preferences and human behavior.new york:springer-verlag, **1981**, 283p.
[18] CR Pool. Up with emotional health. Educational Leadership. **1997**, 54: 12-14.
[19] D Singh. Emotional intelligence at work: A professional guide. New Delhi: Sage Publications, **2002**, 235p.
[20] P Sutarso. Gender differences on the emotional intelligence inventory (EQI). Dissert. Abst. Int. **1999**.
[21] U Tan. *International Journal of Neuroscience*, **1988**, 43(3-4): 177-182.
[22] ML Tapia. A study of the relationships of the emotional intelligence inventory (intelligence tests). Dissert. Abst. Int. **1999**.
[23] V Viriyavidhayavongs; S Jiamsuchon. The Relationship between Emotional Quotient (EQ) and Leadership Effectiveness in Life Insurance Business Organizations, issue of the ABAC Journal.**2001**, 2: 1-12.
[24] E Wing; GD Love. Elective Affinities and Uninvited Agonies: Mapping Emotions With Significant Others onto Health. Emotion, Social Relationships and Health Series in Affective Sci. New York: Oxford Univ. Press. **2001**
[25] P Zoccolotti. *Behavior Genetics*, **1978**, 8: 377-379.