

Relationship between birth order, personality and academic performance

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Objective: To assess the relationship of birth order, personality factors and academic performance.

Methodology: This cross sectional study was carried out at KMS medical college, Sialkot, Pakistan during the month of February 2017. It included 148 eligible consenting 3rd and 4th year medical students who were firstborn, middle, last and only born; 37 from each category were included. Students with past or family history of psychiatric illness, using psychotropic medicine, severe physical and psychiatric illness were excluded. Big Five Inventory-10 was administered, which has personality factors namely openness, conscientiousness, extraversion, agreeableness and neuroticism. Academic performance was assessed by their annual university examination results. Statistical analysis was done by SPSS v 21.

Results: Out of 148 students, 53 (35.8%) were male while 95 (64.2%) were female. Mean age

was 21.13±0.89 years (range 20 to 22). 104 (70.7%) belonged to middle income families. There was no statistically significant difference across the birth order in personality factor of openness (F=1.01) conscientiousness (F=2.12) extraversion (F=1.13) agreeableness (F=.67) neuroticism (F=2.19) and academic performance (F=1.042). Conscientiousness was positively while extraversion was negatively correlated with academic performance. Rest of the 3 personality factors had no significant correlation with academic performance.

Conclusion: Birth order had no relationship with personality factors and academic performance. Of the big five personality factors, conscientiousness had significant positive correlation with academic performance while extraversion had negative correlation. (Rawal Med J 201;43:39-44).

Key words: Birth order, big five, personality, academic performance.

INTRODUCTION

Birth order has been of interest to general public, folklore, and researchers for long time. The way a person behaves, interacts and achieves has been linked to order in which he was born. Galton probably was the first researcher who looked at this in 1874. He noted in a sample of English scientists at that time that there was majority of them first born. He inferred that the first born or eldest child received more attention from their parents and achieved better in academics.¹

Alfred Adler in 1928 was also interested in birth order. His theory of birth order attracted much attention. He thought that children who are born first are privileged in the family. With privilege comes responsibility. They may feel burdened.

When next child arrives in the family, he may be dethroned from the privilege. Score of neuroticism is high in them.² They may conform to the roles of their parents and become leaders. They have high ambitions and achieve more.³ To fulfill their role they perform well in academics and show more responsibility in behavior.⁴ Middle child may not get the same extra attention in the family and make repeated attempts to do better than their older and younger siblings.⁵ The children who are youngest are usually pampered more. This may also be the case with only child. But sometimes they are aware of their different position in the sib-ship so they might make extra effort to get attention.⁴ Research on birth-order and being intelligent yielded convincingly that performance of children in birth

order declines from first to later child on tests of intelligence.⁵ The effect is small but has been repeated in several studies.⁶ Its causes have also been investigated in detail.⁷ A vast body of research has been carried out on the issue of birth order and its effects on personality but findings are inconsistent.⁸

Family Niche is another theory put forward by Sulloway.⁹ It is linked to the Big Five Theory of personality dimension.¹⁰ Sulloway describes that children in a family want to get attention of their parents. Eldest or first born gets that attention and is usually less agreeable than the later born. Later born become more agreeable to get the attention of their parents and are dominated by the first born. First born are less open than later born. Openness in later born children increases the likelihood of getting attention of their parents. Conscientious was found more in first born than the later born child. First born become like their parents while later born are rebellious.⁹

The significance of our study is that there are long held beliefs of Galton, Adler and Sulloway and theories they have proposed and subjective report and views of general public. The objective of the current study was to assess the relationship of birth order, personality factors and academic performance. We hypothesized that personality factors and academic performance will be different across birth order and personality factors of the students will be associated with their academic performance.

METHODOLOGY

The study was carried out at KMS Medical College, Sialkot, Pakistan during the month of February 2017. Ethical review committee of the institution approved the study and written informed consent was taken from all participants. In this cross sectional study, Non-probability convenience sampling technique was used and 3rd and 4th year medical students were included. Inclusion criteria was consenting students who had spent at least 2 academic years in the medical college, had appeared in annual professional examinations conducted by the University of Health Sciences (UHS) Lahore. Exclusion criteria

were students suffering from severe physical or psychiatric illness at the time assessment. Students with past history of psychiatric illness, family history of psychiatric illness or who were using any current psychotropic medicine were excluded from the study.

There were a total of 209 students, 106 from 3rd year and 103 from 4th year. The students were divided into 4 categories first born, middle born, last born and only child born. Of the 4 categories, only child born was least in number. There were 41 students in only child category, 22 from 3rd year and 19 from fourth year. One student was using psychotropic medicine and 3 had family history of psychiatric illness. They were excluded. In the final sample 37 students (19 from 3rd year and 18 from 4th year) were included in this category. For rest of the three categories sample size was set at 37 students so the categories had equal number of students in the final statistical analysis. The rest of the three groups were arranged in lists according to roll number of the students in their respective class. So it was easy to include first 37 eligible students in each category (19 from 3rd year and 18 from 4th year) after applying the inclusion and exclusion criteria.

A data sheet was prepared which contained demographic information, birth order, academic performance, Big Five Inventory-10 (BFI-10)¹¹ and its scores. Academic performance was assessed by calculating the average of the percentage of numbers students got in first and second year annual examination by UHS. Students study human anatomy physiology and biochemistry in first two years of medical college. Results of these 3 subjects were taken for both 3rd and 4th year students to maintain uniformity. The data for academic performance was collected from the college administration, which keeps records of all the students. 5% deduction from total average numbers obtained by the student was done for each failure in examination. There were two students in first three categories each and 3 in only child categories who had failure in annual examination. 5% deduction from their average numbers obtained was done. The demographic and other variables of these 9 students were not very

different from the rest of the sample. All 9 students passed the supplementary examination by UHS and were promoted to the next class.

BFI-10 was then administered. It is a shorter version of the full 44 item BFI. It has 10 items. 2 items represent one dimension or sub-scale of the personality namely openness, conscientiousness, extraversion, agreeableness and neuroticism. Openness includes flexibility, originality and imaginativeness. In Extraversion sociability and assertiveness are included. Agreeableness includes trust, modesty and cooperativeness. Conscientiousness includes responsibility and orderliness. Neuroticism includes hostility, anxiousness and insecurity. The items have questions like "I see myself as someone who is generally trusting". Student rated each item on a 5 point Likert scale ranging from 1-5 (Disagree strongly to agree strongly). Item number 2,6,8,9 and 10 are scored straight (true scored) while rest of the five items are scored in reverse order. BFI-10 had good discriminative as well as convergent validity ($r=0.78$) with 44 item BFI. The cronbach's alpha for the current study was .81.

Analysis of variance (ANOVA) was used to test mean scores of personality factors and academic performance across different birth orders. Pearson correlation test was applied to see the association of personality with academic performance. Analysis was done by SPSS v 21.

RESULTS

There were 148 students, 37 in each category of birth order. 53 (35.8%) were male while 95 (64.2%) were female. Female students were more in number, may be because of open merit seats in the public

sector medical colleges and represented almost the similar percentage in the two classes. Mean age of the students was 21.130.89 years with range from 20 to 22 years. 104 (70.7%) belonged to middle income families while 8 (5.4%) and 36 (24.3%) belonged to lower and upper income families respectively. 111 (75%) were from nuclear, 32 (21.6%) from joint and only 5 (3.4%) from extended family system. Total number of family members were up to 5 in 55 (37.2%), 6 to 10 in 70 (47.3%) and more than 10 in 23 (15.5%) students (Table 1).

Table 1. Characteristics of the sample (N=148).

Variable	Number	Percentage
Gender		
Male	53	35.8%
Female	98	64.2%
Financial status of the family		
Lower	8	5.4%
Middle	104	70.7%
Upper	36	24.3%
Type of family		
Nuclear	111	75.0%
Joint	32	21.6%
Extended	5	3.4%
Total number of family members		
Up to 5	55	37.2%
6 to 10	70	47.3%
More than 10	23	15.5%

Table 2. Mean, standard deviation and F value for birth order, personality factors and academic performance (Anova).

	Only child	First born	Middle born	Last born	F	Sig
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
Openness	3.52 (.82)	3.16 (1.19)	3.39 (.70)	3.43 (.93)	1.017	.387
Conscientiousness	3.39 (.71)	3.00 (1.04)	3.52 (.97)	3.31 (.95)	2.126	.100
Extraversion	2.75 (1.01)	2.85 (1.22)	3.12 (.17)	3.31 (.92)	1.138	.336
Agreeableness	3.59 (.82)	3.43 (.88)	3.68 (.86)	3.68 (1.01)	.672	.571
Neuroticism	3.20 (1.33)	2.74 (1.04)	3.28 (1.20)	2.77 (1.03)	2.199	.091
Academic performance	71.05 (5.36)	69.79 (5.21)	70.21 (4.70)	71.72 (5.26)	1.042	.376

Table 3. Pearson correlation of personality factors and academic performance.

	1	2	3	4	5	6
Openness	-	.081	-.042	.072	-.076	.109
Conscientiousness		-	.180*	.078	.018	.181*
Extraversion			-	.148	-.119	-.186*
Agreeableness				-	.058	.151
Neuroticism					-	.013
Academic performance						-

* $p < .05$

Openness was highest in only child born (mean = 3.52, SD = .82). However, there was no statistically significant difference across the birth order in personality factor of openness [$F = 1.017$ and $p = .387$ ($p > 0.05$)]. Conscientiousness was highest in the middle born (mean = 3.52, SD = .97) but there was no statistically significant difference across the different birth order [$F = 2.126$, and $p = .100$ ($p > 0.05$)]. Extraversion was highest in last born (mean = 3.31, SD = .92), agreeableness in middle and last born (mean = 3.68, SD = .97) (mean = 3.68, SD = 1.01) and neuroticism in middle born (mean = 3.52, SD = .97). Academic performance was highest in last born (mean = 71.72, SD = 5.26). However students of different birth order had no statistically significant difference in extraversion [$F = 1.138$, and $p = .336$ ($p > 0.05$)] agreeableness [$F = .672$, and $p = .571$ ($p > 0.05$)] neuroticism [$F = 2.199$, and $p = .091$ ($p > 0.05$)] and academic performance [$F = 1.042$, and $p = .376$ ($p > 0.05$)]. The first hypothesis was rejected (Table 2).

There was a significant positive correlation of conscientiousness with academic performance [$r = .181$, $p = .028$ ($p < 0.05$)] and significant negative correlation of extraversion with academic performance [$r = -.186$, $p = .024$, ($p < 0.05$)]. There was no significant correlation of openness [$r = .109$, $p = .188$, ($p > 0.05$)], agreeableness [$r = .151$, $p = .068$, ($p > 0.05$)], and neuroticism [$r = .013$, $p = .873$, ($p > 0.05$)] with academic performance. In summary conscientiousness was positively correlated while extraversion was negatively correlated with academic performance. Rest of the 3 personality factors had no significant correlation with academic performance (Table 3). The second hypothesis was only partially supported.

DISCUSSION

The results of our study show that there is no relationship of birth order with personality factors and academic performance. Only conscientiousness was positively related with the academic performance while extraversion had negative correlation. We did not find evidence for the long held beliefs of Galton, Adler and Sulloway in our study.

Studies carried out in Pakistan have mixed results. A study from Hyderabad Sindh reported higher psychiatric morbidity in lower birth order than first birth order. GAD and depression were frequent diagnosis (55%).¹² Ansari et al reported cases with OCD clustered in birth order-one and 44% of OCD patients were found to be birth order-one as compared to 19.40% of the rest of the psychiatric population.¹³ While another study reported from psychiatric OPD Isra University Hospital, Hyderabad. Eighty two Schizophrenics were compared with the rest of the psychiatric population with reference to gender, catchment area, and family type. Statistically no significant difference was found between any of the birth order for the risk of Schizophrenia. Risk of Schizophrenia appears to be minimum in first born males, and maximum in first born females, but this does not reach statistical significance. Risk apparently seems to decrease as birth order goes down among urban setting; and decrease as birth order goes up; but again this finding does not reach the level of statistical significance. The authors concluded that there appears to be no association between any birth order and risk of Schizophrenia.¹⁴

Birth order has been studied even with height birth orders 2, 3 and 4 were associated with shorter height than birth order one respectively.¹⁵ Birth order has also been linked to physical illnesses too. Birth order and pregnancy were independently associated with a higher risk of developing systemic sclerosis.¹⁶ Our study showed similar finding of positive correlation of conscientious with academic performance. However, birth order and academic performance had no relationship in our study.¹ Another study examined pairs of siblings, 161 from university students and 174 from other older adults. Conscientious was higher and openness was lower

in first born than the second born. This is inconsistent with our research.¹⁷

In a study from Gomal University from Pakistan, it was found that males were significantly better than females at different levels of birth order. But at some stages in birth order females were better than males. So the results were mixed.¹⁸ In a study by Joseph, it was seen that family size and birth order had no relationship with academic performance of university students.¹⁹ This corroborates with findings from our study. In a study on engineering students in India, first born were found to be perfectionist and conscientious.²⁰ Responsibility and orderliness in medical and engineering students is required for better academic performance. Our study and study from India report similar findings and corroborate each other in this regard.²⁰

The strengths of our study are that it had simple methodology. A between family design ruled out the genetic and environmental confounding factors. Students were of almost similar age group and both genders were representative of the percentage of students in each class. The assessment questionnaire was brief and easy to understand by the students reducing the ambiguities to respond. The limitations of the study are cross-sectional nature and not using the within family design, which has its own advantages. Students responded on a Likert scale, which has its own limitations. Only medical students were included from a public sector medical college, where only criterion for admission is strict open merit. These students were already high achievers in pre-medical years, where they studied science subjects. In first two years of medical education they studied human anatomy, physiology and biochemistry, which were taken as a measure of their academic performance. In future studies, prospective and rigorous study designs with sample taken from students of different educational institutions and subjects such as arts, humanities, computer sciences, technical and vocational studies should be included. Studies carried out in community based sample might resolve the issue.

CONCLUSION

Birth order had no relationship with personality factors and academic performance. Of the big five

personality factors only conscientiousness had significant positive association with academic performance while extraversion had negative association. Openness, agreeableness and neuroticism had no significant correlation with academic performance.

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