

## A Study of Birth Order, Academic Performance, and Personality

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**Abstract**— This study aimed to investigate birth order effect on personality and academic performance amongst 120 Malaysians. Besides, it also aimed to examine the relationship between personality and academic achievement. Thirty firstborns, 30 middle children, 30 lastborns, and 30 only children, who shared the mean age of 20.0 years (SD= 1.85), were recruited into this study. Participants' Sijil Pelajaran Malaysia (SPM) results were recorded and their personality was assessed by Ten Item Personality Inventory (TIPI). Results indicated that participants of different birth positions did not differ significantly in terms of personality and academic performance. However, Pearson's correlation showed that extraversion correlated positively with academic performance.

**Keywords**- birth order; personality; academic achievement

### I. INTRODUCTION

People are intrigued by the fact that children of a family behave differently although they were raised in the same environment, such as neighborhood, and share the same genetic pools from both of their parents. On top of behaviors, siblings do differ in terms of personality characteristics [1], intelligence [2], familial sentiment [3] and others. Firstborns are always described as being responsible, high achievers and perfectionists whereas lastborns and only child are always described as the baby of the house and are mostly spoiled kids [4]. As a result, these differences among siblings have attracted the attention of researchers over the past decades.

Generally, parents are excited and anticipated about their first child and hence, tend to be overly protective and pay more attention, investment, as well as expectation on this child. However, parents' attention, investment, and expectation vary across children [1]. As the second child arrives in the family, the firstborn may experience dethronement and the same happens to the second born once a third child arrives and so forth [5]. Besides, it was suggested that parental resources that a child received decrease as the sibship size grows bigger [6]. Therefore, every child experiences different level of parental resources and investment as a result of their distinct birth order while these unique experiences will in turn shape their developmental course. To date, most of the birth order effect studies were conducted in the West and there are very little published studies that report on the birth order effect within Malaysia context. Thus, this study aims to examine the

birth order effect on personality and academic attainment among Malaysians who aged between 18 and 24.

### II. LITERATURE REVIEW

#### A. Birth Order and Personality

The pioneer of birth order research, Alfred Adler, had theorized that each birth position has a set of personality traits. Firstborns are always seen as leaders, high-achievers, ambitious, and conforming [4]. They attempt to please their parents via traditional ways, which are through academic performance and responsible behaviors [7]. Middle children, on the other hand, may experience difficulty finding a position of privilege and significance in the family because they never have the opportunity to monopolize parents' attention [5]. Thus, they constantly fight to stay ahead of their younger siblings. In contrast, lastborns and only children are frequently viewed as the spoiled kid of the family. It is because both of these birth positions are the only focus of the family. However, unlike the only children, the later-born children, including the middle children and last-born children, are aware of the higher status of the firstborn, so they will seek alternative strategies to stand out from their siblings [7].

In addition, a dethronement theory was proposed to explain birth order effects on personality development [5]. Before the birth of the younger sibling, the eldest child had his or her parents' complete attention but he or she was later dethroned by a newborn. As a consequence of dethronement, the child would struggle to regain parental attention. This led the firstborn to develop such characteristics as conscientious, conservative, independence and competence [5; 7], which would later facilitate one's academic attainment.

Another theory that describes birth order effects on personality development is family-niches model [8]. According to Sulloway [8], children are motivated to solicit parental investment when they perceive differential parental investment within the family. They compete for parental investment by creating distinctive niches. Sulloway also hypothesized that firstborns are less agreeable as compared to later-born children because firstborns dominate the younger siblings to minimize the diversion of parental investment. In contrast, the younger siblings avoid confrontation with the firstborns to solicit parental

investment, which in turn led them to be more agreeable. Besides, he also suggested that firstborns correlate negatively with openness as compared to later-born children because openness is the factor that assists later-born children to create distinctive approaches to compete for parental investment. Furthermore, he found that firstborn are more conscientious than the later-born children because firstborns reflect their parents' attitudes, beliefs, and personality characteristics whereas later-born children may develop attitudes, beliefs, and personality characteristics that are apart from the eldest sibling and parents. Therefore, Sulloway described that later-born children are born to rebel.

In the past, studies that were carried out to examine the relationship between birth order and personality has generated inconsistent findings. Healey and Ellis [9] who studied university sample (n= 161 sibling pairs) and older adults (n= 174 siblings pairs) reported that firstborns scored significantly higher on conscientiousness and lower in openness to experience than their second born siblings. Moreover, Paulhus et al. [7] had their participants to nominate the most achieving and conscientious sibling within their family and found that the firstborns were rated as more achieving and conscientious than later-born children. On the other hand, Jefferson, Herbst, McCrae [10] administered brief measures of neuroticism, extraversion, and openness to experience to 9964 participants and reported that self-report and spouse rating of personality dimensions were unrelated to birth order. In addition, Parker [11], who administered a short form of NEO-PI to 593 only children, firstborns, middle children, and lastborns, found no relationship between birth order and personality traits too.

### *B. Birth Order and Academic Achievement*

Three theories were introduced to explain birth order effect on academic achievement. First, some of the intrauterine theories claimed that young mother is able to provide a "rich uterine environment" for her earlier born children and hence, results in greater health and intelligence in the earlier born [5]. However, there are intrauterine theories that suggest the otherwise and claimed that mothers experience less labor and are less likely to use forceps in subsequent delivery, which in turn reducing the possible damaging to the child's health and intelligence [5]. Second, confluence hypothesis [12] claimed that the impact of birth order on cognitive achievement was largely influenced by familial intellectual environment and the opportunity to serve as intellectual resource. Familial intellectual environment decreases in respond to increased family size. Therefore, firstborns were born to a higher intellectual environment as compared to the later-born children. However, this is largely depended on the age gap between the siblings. Large spacing is beneficial to the younger while detrimental to the older sibling; small spacing is advantageous to the older but disadvantageous to the younger sibling. Furthermore, older siblings always serve as intellectual resource to the younger siblings and this

stimulates the intellectual development of the older siblings. However, the youngest and only children are never a "teacher" so they do not perform as well as firstborns in academics. Third, resource dilution hypothesis [6] suggested that parental resources (e.g., money, personal attention, cultural objects) are finite and will be diluted by the addition of siblings. According to resource dilution hypothesis, parents are able to devote fully to their only child or firstborn whose sibling has yet to arrive. However, the arrival of new child led the parents to divide their resources accordingly. Besides, this hypothesis also claimed that the relative richness of parental resources also affects one's educational success. As a result, only child and firstborn (who had the full parental resources a few years ago before the arrival of new sibling) had better academic attainment than do later-born children.

There were empirical research findings that demonstrated birth order effect on academic achievement. Travis and Kohli [13] found that birth order did impact the total years of education completed among the middle class population. The authors also found that the only children appeared to excel academically too, which supported the resource dilution hypothesis. In addition, Nuttall et al. [14] reported that firstborn girls had better academic attainment than the later-born girls. However, Edwards and Thacker [15] discovered no association between birth order and grade point average. Besides, Hauser and Sewell [16] also reported no significant birth order effect on academic achievement when other confounding variables were controlled.

### *C. Personality and Academic Achievement*

Interestingly, personality characteristics seem to play a part in one's academic achievement as well. Conscientiousness, agreeableness, and the interaction of conscientiousness and agreeableness were reported to correlate significantly to students' performance in a course [17]. Students who were highly conscientious and agreeable achieved better performance than those who scored low in conscientiousness and agreeableness subscales. In addition, Chamorro-Premuzic and Furnham [18] also found that personality traits such as neuroticism, conscientiousness, psychoticism, and extraversion correlated significantly with exam marks.

If the aforementioned theories are valid, one's personality and academic performance can be predicted by looking at his or her ordinal position. Therefore, the proposed hypotheses of this study are: (1) siblings of different birth positions differ significantly in terms of conscientiousness and agreeableness, in which firstborns are described as being more conscientious and agreeable than the later-born children; (2) there is significant difference in academic performance among firstborns, middle children, lastborns, and only children, in which firstborns and only children are more excelled academically; and (3) personality factors correlate with academic performance.

### III. METHODOLOGY

#### A. Participants

This single survey study recruited 30 firstborns, 30 middle children, 30 lastborns, and 30 only children from Klang valley, mostly from Sunway University College. Participants' age ranged from 17 to 24 years where the mean age was 20.0 years, with a standard deviation of 1.85. There were 35 (29.2%) and 85 (70.8%) males and females respectively. Seventy-five percents of the participants (n=90) were science stream students when they were in high school. Besides, every participant was Malaysian and has taken Sijil Pelajaran Malaysia (SPM).

#### B. Instruments

Participants were required to fill in a consent form and demographic sheet before they proceed to the instruments behind. Participants' SPM results were scored according to the grades that they obtained. Grade A, B, C, D, and F were credited 5, 4, 3, 2, and 1 point respectively. Total points of participants' best 6 subjects represented their academic performance. The higher the total points, the better it was the academic performance of the participants.

Scale used in this study was Ten Item Personality Inventory [19]. Ten Item Personality Inventory (TIPI) is a 10-items brief scale that is designed to measure the constellation of traits defined by Five Factor Theory of Personality: extraversion, neuroticism, openness to experience, conscientiousness and agreeableness. Openness includes the elements of originality, curiosity, flexibility, imaginativeness, and unconventional attitudes. Extraversion is associated with sociability, friendliness, and assertiveness. Agreeableness is characterized by trust, cooperativeness, modesty, and good-naturedness. Conscientiousness refers to responsibility, dependability, orderliness, and diligentness. Last but not least, neuroticism is described by hostility, self-consciousness, anxiousness, vulnerability, and insecurity. Each subscale is measured by two items. Participants were required to rate on a 7-point Likert scale, which ranged from strongly disagree to strongly agree. TIPI has good test-retest reliability ( $r=0.72$ ) and external correlation ( $r=0.90$ ). Besides, it also demonstrates strong convergent and discriminant validity ( $r=0.77$ ) with the full Big Five Inventory.

#### C. Procedure

Participants were approached randomly and were briefed about the purpose of this study. As participants agreed to partake in this study, they were required to sign a consent letter. After that, demographic sheet and TIPI were administered to them. Instruction for each section was written at the top part of every page.

### IV. RESULTS

#### A. Birth Order and Personality

Personality difference amongst birth positions was tested using analysis of variance (ANOVA). Results indicated that firstborn and only child had the highest mean scores for agreeableness (mean = 4.83, SD = 0.81) and conscientiousness (mean = 4.73, SD = 1.33) respectively. See Table I. However, the effect of birth orders on agreeableness [ $F(3, 116) = 1.748, p > 0.05$ ] and conscientiousness [ $F(3, 116) = 0.303, p > 0.05$ ] was not statistically significant. In addition, participants of different birth orders did not differ significantly in terms of extraversion [ $F(3, 116) = 0.781, p > 0.05$ ], openness to experience [ $F(3, 116) = 0.553, p > 0.05$ ], and emotional stability [ $F(3, 116) = 1.003, p > 0.05$ ] too. Hence, first hypothesis was rejected.

TABLE I. ANALYSIS OF VARIANCE FOR PERSONALITY FACTORS

	Firstborn		Middle Children		Lastborn		Only Child		F (3, 116)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
EX	4.47	1.69	4.32	1.29	4.68	1.37	4.83	1.28	0.781
OPE	4.92	1.09	4.83	1.18	5.15	1.15	4.83	0.97	0.553
AGB	4.83	0.81	4.32	0.94	4.72	1.01	4.73	1.00	1.748
CSC	4.50	1.13	4.43	1.14	4.53	1.50	4.73	1.33	0.303
EMOS	4.38	1.02	4.32	1.13	4.78	1.41	4.40	1.03	1.003

Key:

EX = Extraversion; CSC = Conscientiousness; AGB = Agreeableness  
OPE = Openness to experience; EMOS = Emotional stability.

#### B. Birth Order and Academic Achievement

ANOVA was used to compare the mean scores of academic performance across different birth orders. Results indicated that firstborn had the highest mean score in SPM results (mean = 28.40, SD = 2.85) whereas lastborn had the lowest mean score in SPM results (mean = 27.10, SD = 4.77). However, with an alpha level of 0.05, birth order effect on academic performance was not statistically significant at all [ $F(3, 116) = 0.699, p > 0.05$ ]. See Table II. Therefore, second hypothesis was not supported.

TABLE II. ANALYSIS OF VARIANCE FOR SPM RESULTS

	Firstborn		Middle children		Lastborn		Only Child		F (3, 116)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
SPM Results	28.40	2.85	27.27	4.07	27.10	4.77	27.70	3.23	0.699

#### C. Personality and Academic Achievement

Pearson correlation was used to test the relationship between personality and academic performance. Results showed that there was relationship between personality and academic performance. However, significant positive association was only found between extraversion and SPM results [ $r = 0.202, p < 0.05$ ]. Hence, the better the academic performance, the more extraverted the person was. Yet, no significant relationship was reported between other personality factors and SPM results. See Table III. As a result, third hypothesis was supported.

TABLE III. CORRELATION MATRIX DEPICTING RELATIONSHIPS BETWEEN PERSONALITY FACTORS AND SPM RESULTS

	SPM Results	EX	OPE	AGB	CSC
EX	0.202*				
OPN	0.169	0.287**			
AGB	0.085	-0.102	0.114		
CSC	0.085	-0.008	0.123	0.150	
EMOS	0.051	0.049	0.141	0.431**	0.097

Note. \*p < 0.05

Key:

EX = Extraversion; CSC = Conscientiousness; OPN = Openness to experience; EMOS = Emotional stability; AGB = Agreeableness.

## V. DISCUSSION

This study was conducted to examine birth order effect on academic achievement and personality as well as the relationship between personality and academic achievement. Results showed that participants of different birth orders did not differ significantly in terms of personality. Therefore, based on this study, it was concluded that participants' personality was not the result of their experiences of being dethroned or the distinctive niches that they have created in the family. Such results contradicted the findings of Healey and Ellis and Paulhus et al.'s studies. This could be due to methodological differences in data collection between present study and others. For instance, Paulhus et al. [7] had their participants nominate the most achieving and conscientious sibling within their family instead of assessing siblings' personality traits using personality measures. Furthermore, birth order effects on personality were reported when peer-rating method was employed [10]. On top of methodology difference, insignificant results could be due to the use of between-family comparison too. In birth order research, the use of within-family design was more advantageous than the use of between-family design as it could minimize the variation of parental personality traits, socioeconomic status, sibship size effects and others [20]. Therefore, insignificant results could be due to confounding variables such as: method of data collection, sibship size, socioeconomic status, parenting styles and others.

In addition, this study found that birth order had no effect on Malaysia college students' SPM results. A few possible explanations were suggested to justify the absence of birth order effect on participants' SPM results. First, participants of the present study comprised of college students. In order to be enrolled into college, every student has to fulfill the entrance score. As a result, participants of this study are all high-achievers already. This is shown in their average SPM results' score. The mean SPM results score of this study was 27.62 out of 30. Besides, parental age and age difference between siblings, which were not controlled in the present study, could be the determinants of one's academic attainment as well [15]. Third, insignificant results could be due to the artifacts of study design. Due to the fact that present study was a between-family design, there was a high possibility that SPM results could be influenced by other confounding variables, such as parenting styles, parental expectation, familial intellectual environment, and biological determinants. Last but not least,

sibship size was found to exert a greater effect on individuals' academic attainment than birth order did after age, socioeconomic background, religion, community size, southern origin and family status were controlled [21]. Thus, more systematic research is required to examine the roles of birth order and sibship size in one's academic achievement.

Furthermore, this study found that there was significant relationship between personality and academic performance. However, significant relationship was reported between extraversion and SPM results only. One of the possible explanations for such relationship was that current study comprised of mostly science stream students. In Malaysia, high school science stream students are obligated to study Mathematics, Additional Mathematics, and two or all science subjects (i.e. Chemistry, Biology, & Physics) whereas art/business students are required to take combination subjects of History, Geography, Principles of Accounts, Business or Basic Economics. As compared to art/business students, the subjects that science students enrolled into require complete understanding and application. Besides, science is all about exploration, research, and experiments where students are expected to learn by conducting experiment. Thus, it was postulated that being extraverted is advantageous for science stream students as they have to explore, research and experiment in order to master the knowledge. Conversely, conscientiousness or agreeableness do not seem to play an important role in the progress of gaining knowledge for science stream students. Another possible explanation for the reported relationship was based on Eysenck's theory. According to Eysenck's theory [22], arousal level difference between introverts and extraverts causes the differences observed in their response to task performance and environment. Introverts who have higher level of cortical arousal is likely to result in poorer performance in stressful events whereas extraverts who have lower level of cortical arousal is likely to bring about better performance under stress. Therefore, extraverted students should be able to perform better in stressful event, such as examination.

There are several limitations to this study. First, most of the participants were recruited from Sunway University College. Hence, research findings might not be strong enough to be generalized to every young adult in Malaysia. Second, age gap and sibship size, which might lead to the absence of birth order effects, were not controlled in this study. Last of all, findings of this research could be the artifacts of the nature of between-family study design. Despite the aforesaid limitations, current study consists of a number of strengths that made research findings valid and informative. First, this study involved equal number of participants from different ordinal positions and hence, research findings were not biased in terms of birth position. Second, the issue whether only child is raised as a firstborn or lastborn is still a controversial one so some studies either excluded only child from their study or grouped them into the firstborn category. Therefore, the inclusion of only child

as a distinct birth order category was a merit of current study. Third, this study employed tool (i.e. TIPI) that has strong reliability and validity. Last but not least, this study was one of the very little studies that examined birth order effects in Malaysia context.

For future study, it is recommended to increase the sample size and collect data from various universities so that the power and generalization of the study could be improved. Besides, researchers should take such confounding variables as sibship size, age gap between siblings, or socioeconomic status into account if birth order study were to be conducted. Moreover, researchers should attempt to employ within-family design to study birth order effects so that confounding variables are well-controlled.

In conclusion, this study reported that birth order effects on personality and academic achievement was absent in Malaysia context, amongst Sunway University College students at least. However, extraversion was found to correlate positively with academic achievement.

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