

Sibling Birth Order Among Undergraduate University Students and Its Influence on Personality Traits: Some Implications for Education

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Abstract

This cross-sectional survey explores the influence of sibling birth order on university students' personality traits. The sample consisted of 184, predominantly Chinese, Malaysian undergraduates of a private university in Malaysia. The Big-Five personality questionnaire (John & Benet-Martinez, 1998) was used for data collection, while Confirmatory Factor Analysis (CFA) and path analysis from SEM were used to analyse the data. The CFA results show a significant interrelationship between the traits of extroversion and agreeableness but no significant direct effect of birth order on personality traits. The results are consistent with the previous studies in Malaysia and around the globe and suggest the likelihood of other factors (e.g., social culture and environment) possibly influencing student personality. Subsequent research that employs various Malaysian samples is needed to further test the applicability of Sulloway's theory in explaining the influence or effect of sibling birth order in Malaysia.

Keywords: *Birth order, Big Five personality traits, Sulloway's theory, family influence, Malaysian undergraduates*

INTRODUCTION

Personality is considered as a mirror that reflects who a person is—his/her attitude, character, nature and inclinations. As a psychological construct, personality is of particular interest to psychologists and behaviourists in understanding individual differences among people; its enduring impact on a person's perception, thinking, cognition and emotion; and their relationship with others. The formation of personality can be discussed from different perspectives. According to Friedman and Schustack (2009), there are eight basic aspects of personality. These include the psychoanalytic aspect, the neo-analytic and ego aspect, the biological aspect, the behaviourist and learning aspect, the cognitive and social-cognitive aspect, the trait and skills aspect, the humanistic and existential aspect and the person-situation interaction aspect.

In regard to the biological aspect, Røysamb et al.'s (2018) study on genetics and personality found a moderate effect of heritability and genetics on personality. In particular, from the five personality domains, neuroticism, extraversion and conscientiousness are affected by common genetic and environment factors (Weiss et al., 2008; Røysamb et al., 2018). Polygenic analyses that were conducted by Sanchez-Roige et al. (2018) on human genetics and personality found a significant positive relationship between personality and psychopathology. On this account, there are other factors beyond birth order that potentially affect personality.

Sibling birth order is globally reported to play a role in affecting personality formation. Research exploring the influence of sibling birth order on personality formation was first introduced in 1931 by Alfred Adler, a neo-analytic theorist (Feist & Feist, 2009), who asserted that our personality influences our career and the way we deal with our lives and tasks (Keat & Mazlan, 2019). Birth order can be categorized into first-born, second-born, middle-born, last-born and only child, in which the different birth order has different characteristics that may influence personality.

Birth order effects can be caused by role expectations (Rohrer et al., 2015), as individuals born on a particular day have no choice but to fit into the role expectations associated with their birth order. Parents have different role expectations of their children according to their birth order. For example, first-borns are expected to bear more responsibilities in the family. The eldest child is expected to build a good role model for their later-born siblings, while the later-born child is expected to follow the rules and advice of their elder siblings. Education wise, parents' attitudes towards their children tend to vary based on birth order. To illustrate, parents may exert a greater pressure on their first-born children to get good grades and achieve academically while being less stern on their later borns. Academically, first borns are generally expected to be role models to their siblings. Differential expectations and investments of parents based on their children's birth order inevitably lead to qualitative differences in the educational experiences and outcomes of the children and can strongly influence their personality development (Rohrer et al., 2015). Research shows that children essentially develop different personalities to meet the expectations of their parents, hence reflecting the dynamic nature of familial influence on aspects like self-esteem, self-acceptance and academic achievement (The Fawcett Society, 2020).

In addition, sibling birth order effects can also be understood in terms of the consequences of stereotyping. To illustrate, children tend to be stereotyped in the sociocultural environment based on their birth order, where first-borns are commonly described as more responsible and caring because

they help to take care of their younger siblings. In contrast, last-borns are considered to be spoiled and dependent because they have been taken care of since they were young, while only-borns are usually described as lacking in social skills because they have no siblings to interact with. Despite the long-lasting effects of stereotyping, recent evidence indicates that parents still limit their children based on harmful (especially gender) stereotypes which, over the long run, create negative impacts on children's potential and academic achievement (The Fawcett Society, 2020).

However, although these stereotypes may not be true because they are developed from the adult's observation and rationale, stereotyping and labelling children causes an enduring effect on them because children may believe the stereotypes and develop their personalities by fitting into the birth order stereotypes. There is an overwhelming body of research to show that stereotyping limits a child's potential and destroys their self-esteem (Oppenheim, 2020). Therefore, the role of parents in eliminating stereotyping among children is critical as it has a large impact on their growing-up experience and personality development. Subsequently, this research aims to address the following questions: (1) Is there any significant direct effect of sibling birth order on the Big-Five personality traits among Malaysian university students? (2) What is the dominant personality trait among first-, second- and last-born siblings? (3) Is there any interrelationship between personality traits?

LITERATURE REVIEW

Birth Order Effects on Children's Well-Being and Development

In ongoing research, birth order has been reported to have an impact on how individuals behave or act in the community and society. According to Adler's theories, a person's engagement with the community is shaped by his or her state of happiness and mental health. Research evidence shows that the impacts of family interaction and caregiving experience encompass both psychological and medical outcomes. The position of a child in the family is predicted to shape his/her personality and how they respond to physiological stress (i.e., the manner in which the child responds to stressful situations). A study by Callaway (2018) on birth order and anxiety found firstborn and only children scoring high on anxiety. Firstborns were also found to be more open and prone to stress than later borns in Ramirez's (2020) investigation on birth order and anxiety.

In regard to child development, a child's personality is collectively shaped by birth order (i.e., position among siblings), social economic status (SES) and parental attitudes (Grace, 2014). A child's emotional well-being, which forms part of his/her personality make-up, is also affected by a range of factors. Psychologists have discovered a variety of psychological effects of birth order on psychiatric illness, depression, anxiety and disorder (Fukuya et al., 2021; Callaway, 2018). This is due to the fact that depression and anxiety develop gradually from sadness. For example, a child can be sad when losing his/her parents' attention to another child or to other siblings, thinking that he/she is neglected. That being the case, middle-borns are more prone to sadness than their other siblings as they tend to feel less important in the family due to their position among siblings (Ansari & Rehman, 2008, as cited in Elalky et al., 2015). In further investigating the impact of birth order, researchers have found some effects of birth order on children's language development. Parents, family and caretakers tend to get worried when a child does not progress normally or when he/she exhibits developmental delays, such as speech delay.

As a result, doctors tend to consider many factors when treating cases dealing with language development. A study conducted on child development at McGill University regarding the benefits of overhearing conversations between birth orders showed no differences, whereas a study spanning from 1975 to 2001 indicated that first-born children were exposed to adult language usage, while later-born children tended to use more immature language. This exposure is reported to have an impact on IQ scores (Lloyd, 2011). With the proliferation of birth order and IQ research, evidence collected around the world from the U.S., U.K., and Germany has convincingly proven the effect of birth order on intelligence. Sibship size is a confounding variable that is also reported to have an effect on intelligence. Later-borns could be perceived as being less intelligent than firstborns, as they are more likely to be born into families with low socioeconomic status (Rohrer et al., 2015).

Birth Order and Personality

Typically, every child wants to be the “apple” of their parents’ eyes; hence, birth order effects can also be discussed in terms of sibling competition. Competition among siblings to gain their parents’ love and attention makes a child change in order to stand out from the other siblings and appear different. Sulloway (2001) conducted his research based on the evolutionary theory and concluded that sibling competition and birth order contribute to the formation of personality. This finding is congruent with Darwin’s perspective in which the personality of humans is diverse due to the different strategies adopted to deal with the problems relating to survival and reproduction (Sulloway, 2001).

Birth order, or position among siblings, is reported to influence human behaviour and personality. The famous 2009 book of Dr. Kevin Leman titled, “*The Birth Order Book: Why You Are the Way You Are,*” looks at the effects of birth on personality, relationships, marriage, career and parenting styles. He stated that there is a difference between first-born and second-born children and believed that the differences in sibling personalities have to do with their birth orders (Leman, 2009). The way people interact and associate with others at home or at the workplace is strongly influenced by their birth order.

Birth order, perhaps, is the answer as to why children who share the same genes and grow up in the same environment can have different personalities. According to Dunn and Plomin (1991), non-shared environmental factors can affect individual development, hence resulting in different developmental outcomes. According to Sulloway (2010), first-borns are more conscientious, responsible, hardworking, self-disciplined, and academically successful, whereas later-borns are more extrovert, rebellious, attracted by new things, submissive and easy-going.

In the workplace, birth order is expected to play a big role, especially in terms of success and achievement. First-borns are more likely to be CEOs, senators, and astronauts, and have the tendency to become richer than their younger siblings. Although this does not mean that the younger siblings are deprived or not likely to achieve the same success, the road or the process towards this end tends to be very different for them. Thus, studies of CEOs have indicated that first-born CEOs tend to lead their companies conservatively and work on improving things gradually, while last-born CEOs tend to believe in bringing in new things or reinventing everything in the company rather than improving and reforming what is already in place.

In addition to this, last-borns are prone to take bigger risks with projects or products, while firstborns might not take risks. Middle-borns might be active in negotiating, or bargaining, compared to last-borns, but last-borns are good and successful in whatever they do as long as they do things with collegiality (Kluger, 2016). Firstborns are often reported to have the potential to become good and responsible leaders in the community—as they have the privilege of receiving their parents' love, attention, time, and experiences in good due, which cumulatively contribute to their emotional strength and self-confidence. Due to normally high parental expectations for them to succeed, first-borns may be prone to high pressure. As a result of that, they tend to be very cautious and meticulous in their approach to tasks (Wallace, 2018).

Research on Birth Order and Personality in the Malaysian Context

In Malaysia, there is a scarcity of research done about birth order and personality. Heng et al. (2016) found that a significant relationship existed between birth order and personality among psychology students at the University of Sabah. The found conscientiousness to be the dominant personality trait among the sample; and first-borns and last-borns to have lower levels of agreeableness compared to middle-borns. Meanwhile, later-borns reported lower levels of openness compared to middle-born children among the sample. A Malaysian study by Boon and Mazlin (2019) on the link between birth order and personality established a correlation between birth order and the trait of intuition. Another research conducted by Tshui and Cai (2011) among a sample of private university college students discovered that students with different birth positions did not differ significantly in terms of personality and academic performance.

In Malaysia, research evidence on this issue is scant. There is much more to explore in the Malaysian context using different research methods, instruments and target populations. Research in this area is important because it relates to parenting issues among Malaysians. Although parents in Malaysia may not be aware of their contribution to the effects of children's birth order, they have, of late, shown growing concerns on issues affecting children, such as sibling rivalry and competition. An important study by Hashim and Ahmad (2016) titled, "*Family Environment, Sibling Relationship and Rivalry towards Quality of Life,*" revealed that sibling relationships are problematic in Malaysia and that these problems lead to jealousy and prejudices, especially when parents take sides or show favouritism.

If parental awareness of birth order effects remains low, children will fall victim to their parents' ignorance and the consequences of this will be many. First, children of such parents may have poor mental health. They may feel depressed, frustrated, stressed and jealous of their more competitive siblings. Second, as a result of these unhealthy emotions, children may later develop problematic behaviours and engage in juvenile delinquency to seek special attention from parents. Third, adverse birth order effects may impact children's personal development and future career competitiveness, for instance, in cases where later-born children develop low self-confidence. Furthermore, negative feelings, such as inadequacy and inferiority, that develop from the failures of sibling relationships may continue into adult life and intervene with career success. Children who suffer from this tend to fear responsibilities—or evade them—and may even have low initiative in their adult lives.

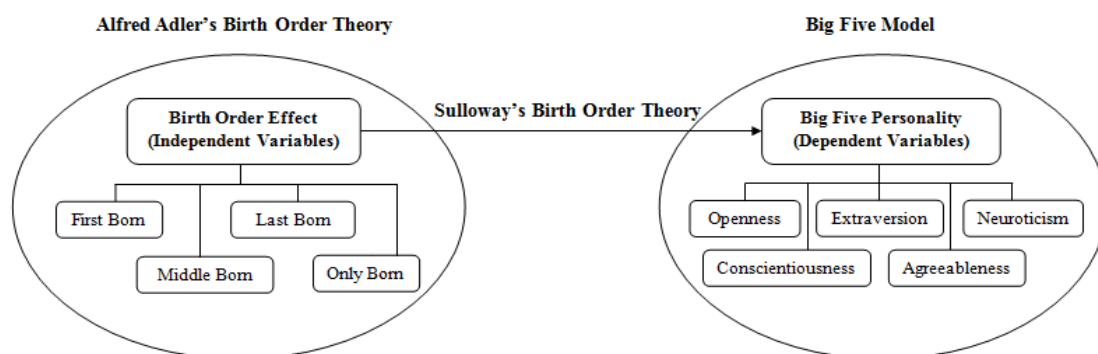
In sum, birth order may have an effect on personality based on the theories of Alfred Adler, Bowen, Toman and Sulloway. The personality theory used in this proposed research is the Big Five Model, which categorises personality into five dimensions—openness to experience, agreeableness, extraversion, conscientiousness and neuroticism. Birth order has been found to exert an impact on various aspects of students, such as academic performance, intelligence level, mental health and relationship with others. Sometimes unintentionally, parents play a significant role in fostering sibling competition, and the perception of fairness in parental treatment may also impact the relationship between siblings. However, there are confounding variables that may affect the validity of birth order studies, such as family size, socioeconomic status and non-shared environmental experiences. In addition, the findings of extensive extant literature on birth order effects provide an understanding of the birth order effect on personality traits and lifestyle characteristics.

Theoretical Framework

As shown in Figure 1, which represents the study's theoretical framework, this research is predicated on three theories, namely Alfred Adler's and Sulloway's birth order theories and the Big Five Personality Traits theory.

Figure 1

Theoretical Framework



Alfred Adler's birth order theory explains that people can be categorized into different birth positions according to their sequence of birth in the family. The eldest in the family is the first-born; the youngest in the family is the last-born; the siblings in between the first-born and the last-born are the middle-born; and the only child is the only-born. Alfred Adler, the founder of individual psychology, is one of the earliest psychologists who discussed birth order. The formation of personality depends on the perceptions and interpretations of children in their position as first-born, second-born, middle-born, last-born or only-born (Bitter, 2008). The first-born child is described as having a unique position because the first-born can gain full attention and love from the parents before the next sibling is born and when their dethroned, they might not recover back (Keat & Mazlan, 2019). Dethronement refers to an older child's feeling or perception that he/she is being unloved or neglected by parents who are perceived to be shifting their attention from the older child to the newborn in the family.

From the psychoanalytic perspective, the formation of personality is influenced by the conflicted psychosexual development, the subconscious mind and sexual drives (Friedman & Schustack, 2009). The key theorist in the psychoanalytic perspective was Sigmund Freud. However, according to the neo-analytic and ego perspective, personality formation is affected by the sociocultural environment, life goals and self-concept. The theorists included Carl Jung, Alfred Adler, Erik Erikson and Karen Horney. Next, the biological perspective argues that human personality is formed and predetermined by our genes, brain structure and instincts (Friedman & Schustack, 2009). It emphasizes genetics and the evolution of the species rather than the sociocultural environment.

On the other hand, theorists from the school of behaviorist (e.g., Skinner, Dollard and Miller) claim that personality is developed through classical conditioning, reinforcement, punishment and extinction. The cognitive aspects emphasize the importance of thought processes, perception and schemes in the development of personality. Cognitive aspects see humans as scientists and they are the decision makers (Friedman & Schustack, 2009). From the trait and skills perspective, people have their unique personal styles and disposition. Humans are categorized according to their traits, skills and abilities. The humanistic and existential aspects explain that personality is the result of the strive for self-actualization, self-fulfillment, well-being and dignity (Friedman & Schustack, 2009). The important theorists of humanistic and existential aspects are Abraham Maslow, Carl Rogers and Erich Fromm. Lastly, the person-situation interaction aspects claim that people in different situations will have different selves (Friedman & Schustack, 2009). In other words, human personality is caused cumulatively by the situations a person finds himself in.

For the Big Five Model, it is a model that explains people's personality based on five traits, which include openness, conscientiousness, extraversion, agreeableness and neuroticism. Also known as the Five-Factor model, the Big Five Model is a hierarchical categorization of human personality into five dimensions that include Openness to Experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism (McCrae & John, 1991). Openness to experience refers to the tendency to be original, imaginative, curiosity and accepting of novel experiences. Conscientiousness is characterized by traits such as being responsible, self-disciplined, dependable and organized. Extraversion is the tendency to be sociable and outgoing (Huffman, 2006). Agreeableness encompasses the characteristics of being cooperative, gentle, good-natured and helpful (Huffman, 2006). Neuroticism is defined as individual differences in how people experience distress and respond to them in different cognitive and behavioural styles (McCrae & John, 1991). People with high neuroticism often have the experience of negative effects and a higher possibility of developing psychological disorders (McCrae & John, 1991); people with low neuroticism are emotionally calm and relaxed (Huffman, 2006) as neuroticism relates to stress and neurotics are anxious (Baptiste, 2018).

Furthermore, the Big Five personality structure includes a wide range of characteristics that explain differences in the behaviour of individuals (Baptiste, 2018). It has been widely used and is categorized as one of the most popular personality theories with five main traits that describe human personality and explain individual differences (Bartone et al., 2009; Xi, 2016). Birth order position is believed to have a specific relationship with personality development among siblings, while the Big Five personality traits are considered a comprehensive classification of individual differences (Consten, 2017). The model is perceived as the most widespread viewpoint in studying the structure of human traits (Otero-López et al., 2021) and most psychologists in the field of personality agree

with McCrae that the five broad dimensions are the best in summarising human personality (Muhamad et al., 2018).

Moreover, research on the five factors is frequently conducted using different methods and instruments across cultures. Hence, with the frequent usage of this model around the world, its validity and reliability can be continuously maintained and assured. In relation to this, Sulloway's Birth Order theory indicates that birth order has an effect on the Big Five personalities, arguing that first-born and later-born siblings have differences in personality and characteristics.

Conceptual Framework

Figure 2 shows the study's conceptual framework which explains the main research constructs and variables. This study hypothesised the following measurement model to test the effects of sibling birth order on the personality traits of Malaysian undergraduates.

Figure 2

Conceptual Framework and Measurement Model

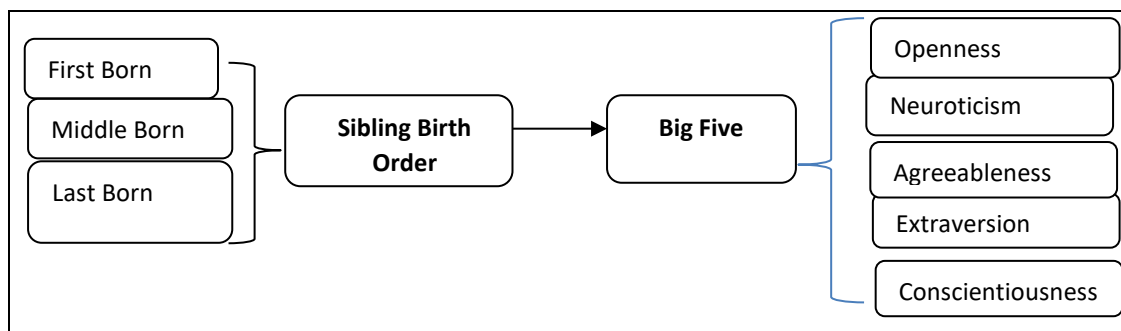


Figure 2 shows the conceptual framework of the study postulating the relationship between the Big Five personality traits and sibling birth order. In terms of the interrelationships among the personality variables, studies have found a relationship between openness and conscientiousness (Costa & McCrae, 1992), and openness and extraversion (Aluja et al., 2002), while in other studies, agreeableness, extroversion, conscientiousness and openness were reported to be inversely linked (Beckmann et al., 2010; Bagherian & Mojambari, 2016; Shi, 2018). Additionally, the conceptual model was designed with reference to the theoretical model by explaining the three theories used in this study and their connectivity. From this conceptual model, the main research model is developed and validated using Confirmatory Factor Analysis (CFA).

METHODOLOGY

Research Design

Positioned within the positivist paradigm, this research used the ex-post facto, or retrospective, research design with cross-sectional survey as its data collection method—with the aim of determining or predicting university students' personality traits based on their birth order. It involved

collecting data on the students' birth order and personality traits from existing records and self-reports without manipulating their birth order.

Population and Sample

The target population for this study comprised 3,111 Malaysian students enrolled in various degree programmes at a private university in Malaysia that has a predominantly Chinese student body. The sample consisted of 184 male and female—mostly Chinese—undergraduates pursuing different specialisations at the private university. The sample size was determined based on Cochran's formula, expressed as follows:

$$n = \frac{Z^2 \times p \times (1-p)}{E^2}$$

where,

n = the minimum sample size required;

Z = the Z -score corresponding to the desired level of confidence (e.g., 1.96 for a 95% confidence level)

p = the estimated proportion of the population with the characteristic of interest (if unknown, 0.5 is commonly used for maximum variability)

E = the desired margin of error (expressed as a proportion)

Therefore, based on a 5 to 6.7% margin of error, 95% level of confidence and the population size of 3,111, the minimum sample size needed for the survey was 201. The study sent more than 200 copies of the questionnaire to the target respondents but due to missing values and non-responses, only 184 cases could be used for data analysis.

The choice of using undergraduates as the survey respondents was first due to the scarcity of research on birth order and personality among university students (Shi, 2018) and second, to university students' ability to express themselves well compared to children. Choosing university or college students was also an appropriate research decision due to their being in a transitional period from adolescence to young adulthood, which is an interesting phase of development to explore as their neurological and psychosocial developmental changes will tend to influence their personality traits (Arnett, 2000; Blonigen et al.; Shi, 2018).

Instrument

The survey instrument was an adapted questionnaire on the Big Five Inventory (BFI), which is a self-report inventory designed to measure the Big Five dimensions of personality (Rammstedt & John, 2007). In the first part of the questionnaire, the respondents were asked to indicate their birth order (i.e., position among siblings) and other demographic information. The second part contained 44 items measuring the five personality traits, namely extraversion, neuroticism, openness, agreeableness and conscientiousness. The BFI was created by John and Benet-Martinez in 1998 (Benet-Martinez & John, 1998) and has been translated into different languages (i.e., Chinese, Dutch, German, English, Hebrew, Italian, Lithuanian, Portuguese, Spanish and Swedish). It has also been

widely used by many researchers in different cultural, social and educational contexts to understand the nature and dimensions of personality. The BFI is available online for non-commercial research purposes (Berkeley Personality Lab, 2007).

Data Collection and Ethics

Data were collected manually by distributing copies of the questionnaire to students on the university campus. Participation in the survey was voluntary and the respondents' informed consent was sought before data collection. For the survey, the respondents were given 10 minutes on site to complete the questionnaire. Data collection continued until the target quota of first-, second-, last- and only-born children was fulfilled.

Data Analysis

To answer the research questions, Confirmatory Factor Analysis (CFA) was applied on the data to first determine the validity of the instrument and second, to develop a sibling order developmental model. In addition, the model-fit was checked and the intercorrelation between the latent variables was explored to know the influence of birth order on dominant personality traits. To do this, AMOS version 18 was used. The composite reliability and convergent validity measures were checked to standardize the measurement scales and determine their construct validity (i.e., if they really measured what they were intended to measure). CFA was used to check the interrelationship between the five personality traits, while path analysis was used to determine the direct effect of three birth order groups (i.e., first-, middle- and last-born) on personality traits.

RESULTS

Respondents' Demographics

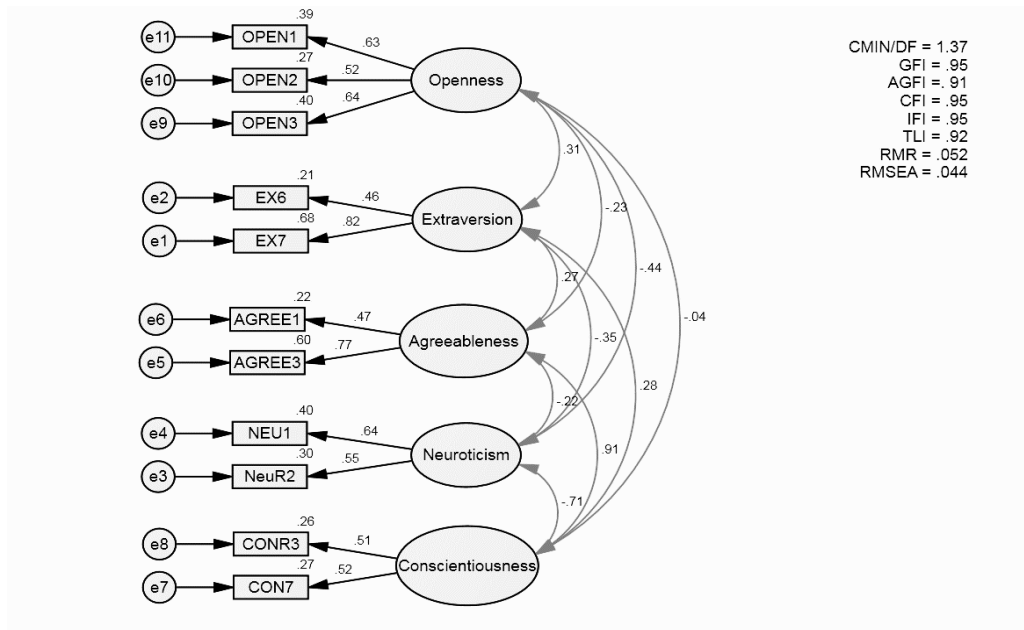
The sample that comprised 184 university undergraduates were divided into three birth order groups, i.e., 35.3% first-born (n=65), 30.4% middle-born (n=56) and 34.2% last-born (n=63). In terms of gender, the sample was predominantly female (61%, n=112). Male students made up 39% of the sample (n=72). Chinese students had the largest representation in the sample (88.6%, n=163), while the rest were Indian (9.8%, n=18) and Malay students (0.5%, n=1), as well as those of other races (1.1%, n=2). The respondents were doing undergraduate degrees at the following faculties (in descending order of representation): Business and Information Science (32.1%, n=59), Pharmaceutical Sciences (20.1%, n=37), Social Sciences and Liberal Arts (17.9%, n=33), Applied Sciences (13%, n=24), Engineering, Architecture and Built Environment (10.3%, n=19) and Medical and Health Sciences (6.5%, n=12).

Sibling Order Developmental Model

Figure 3 shows the results of the CFA, indicating ten fit indices for the Big Five Personality Traits.

Figure 3

Confirmatory Factor Analysis of Big Five Personality across Birth Order Groups



To assess the fit of the measurement model, the analysis relied on a number of descriptive fit indices. In testing unidimensionality, the study ran CFA on the measurement models for each of the five factors representing the Big Five personality traits. The results included a Comparative Fit Index of Bentler (CFI) = .952, Adjusted Goodness-of-fit Index (AGFI) = .917, Goodness-of-fit Index (GFI) = .957, Tucker-Lewis Index (TLI) = .922, Incremental fit index (IFI) = .956, Root Mean Squared Error of Approximation (RMSEA) = .044, and Root Mean Square Residual (RMR) = .052.

The chi-square goodness-of-fit test statistic (χ^2) had a value of = 46.657 which, when evaluated with 34 degrees of freedom, had a corresponding p-value of 0.73. This p-value was above .05, which means the null hypothesis of the goodness-of-fit should not be rejected. This is a goodness-of-fit indicator of the overall model. In addition, another measure of fit used in this study is the CMIN/DF (minimum discrepancy), which was =1.57. A value below 2 is preferred although that between 2 and 5 is considered acceptable. A comparative fit index (CFI) of 0.9 or above for the model implies that there is strong evidence of unidimensionality of the factors (Sureshchandar et al., 2002 as cited in Al-Hawari et al., 2005). Therefore, it can be concluded that the model fits the data and that all these indices support the model of the Big Five Personality Traits across birth order categories in the Malaysian sample. Furthermore, in this study, there was evidence of unidimensionality for the factors.

Evidence of Validity and Reliability

In this study, composite reliability was calculated, as shown in Table 1, to measure the reliability of each factor. Composite reliability should be greater than 0.7 and the variance extracted > 0.5 to indicate that the factors are reliable (Hair et al., 1995; Holmes-Smith, 2001). As suggested by Jöreskog (1971), a cut-off value of 0.6 for loading is considered reliable (Nunnally, as cited in Blanco et al., 2010). For convergent validity, the indicators for a given construct should be moderately correlated among themselves. This was tested by checking that the factor loadings of the confirmatory model were statistically significant (level of .01), as shown in Table 3, and higher than .05 points, as shown in Figure 3 (Steenkamp & Geyskens, as cited in Blanco et al., 2010). Two indicators, "Agreeableness 1" and "Extraversion 6" have an index of .47 and .46, respectively. Although they are slightly below .50, they can still be considered acceptable as the values are above .45. Therefore, convergent validity of the measure was established in this study. Hence, it can be concluded that the variances are averaged across the observed variables and are related theoretically to their respective latent constructs.

Table 1

Measures of Composite Reliability (CR)

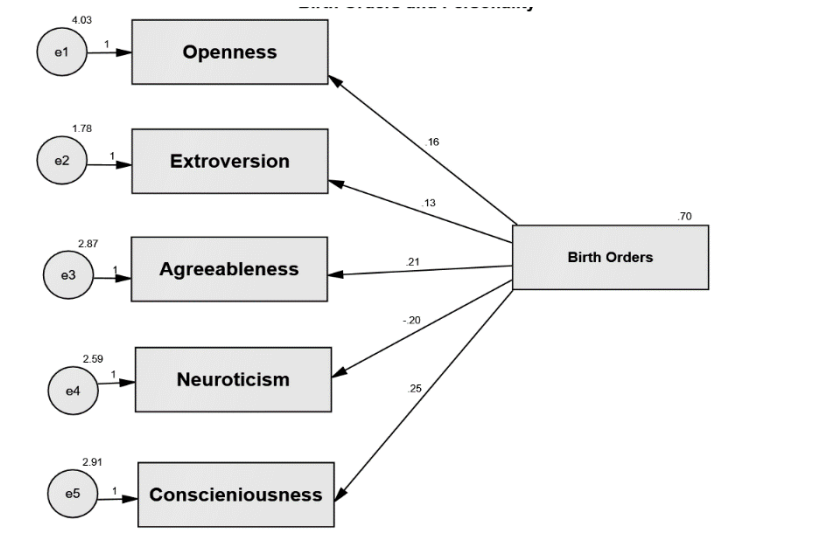
Personality Trait	Composite Reliability (CR)
Openness	0.75
Conscientiousness	0.66
Agreeableness	0.65
Neuroticism	0.66
Extraversion	0.64

The significance of each indicator under each construct is illustrated in Table 2 and indicates that the probability of getting a critical ratio as large as 2.396 in absolute value is .017 for Ex 6, as large as 4.054 in absolute value is less than 0.001 for Neu 1, Agree 1, ComR3 and Open 1 and 2. Therefore, the regression weight for Extraversion in the prediction of Ex6 is significantly different from zero at the 0.05 level, and the regression weight for Extraversion in the prediction of Ex1, Agreeableness in the prediction of Agree1; Conscientiousness in the prediction ConR3 and Openness in the prediction of Open 1 and 2 of 0.001 is significantly different from zero at the 0.05 level (two-tailed).

Effect of Birth Order on Personality Traits

Figure 4

Path Analysis of Birth Order and the Big Five Personality Traits



This study used path analysis to determine the effect of birth order groups (i.e., first-, middle- and last-born) on personality. Path analysis is normally used to determine the direct-effect of the exogenous variable (independent) on the endogenous variable (dependent). As shown in Figure 3, there is no direct effect of all three birth order groups (i.e., first-, middle- and last-born) on all personality traits. Moreover, to further examine the effect of birth order on personality for accuracy, the study performed a multivariate analysis. With the Box’s of equality of variance and Levene’s test of equality confirming and demonstrating equality across groups, the study checked the significance of Wilk’s Lambda and found no significant effect of birth order on personality traits. Thereafter, there was no need to look at contrasts or the between-subject effects table because the univariate tests were insignificant.

Table 2

Multivariate Tests for Birth Orders and Personality Traits

	Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.991	4016.511 ^b	5.000	177.000	.000
	Wilks' Lambda	.009	4016.511 ^b	5.000	177.000	.000
	Hotelling's Trace	113.461	4016.511 ^b	5.000	177.000	.000
	Roy's Largest Root	113.461	4016.511 ^b	5.000	177.000	.000
Birth Order	Pillai's Trace	.075	1.381	10.000	356.000	.187
	Wilks' Lambda	.927	1.377 ^b	10.000	354.000	.189
	Hotelling's Trace	.078	1.372	10.000	352.000	.192
	Roy's Largest Root	.052	1.854 ^c	5.000	178.000	.105

DISCUSSION

The results of this study indicate that birth order—or position among siblings—in the family plays a non-significant role in influencing personality as claimed by some previous studies (Ma, 2021; Omasu et al., 2016; Esmaili & Amirsardari, 2017). From the behaviourism perspective, it was claimed that personality could be affected by learning through classical conditioning, while others claim that cognition or cognitive processes play an instrumental role in personality development. These claims are supported by the humanistic school of thought, which believes that people in different positions act differently and that human personality is influenced by the position one holds. However, the results of the present study do not support the preceding claims of behaviourism as birth order was not found to exercise any significant effect or influence on personality traits among the selected sample of undergraduate Malaysian students.

Looking at the interrelationships between personality traits and all birth order groups, the study found no link between openness and conscientiousness. Since all three birth order groups were merged together as one unit or variable, the study could not determine which of the groups contributed to the no-significance results. Theoretically, however, first-borns are more inclined toward conscientiousness, while last-borns are prone to openness; and both are completely different in terms of characteristics and sibling birth order. The theory somewhat supports the argument of Costa and McCrae (1992) who maintained that a conscientious personality could only work with someone with a low-openness personality.

In addition, this study confirms the positive relationship between open personality and extraversion across all sibling birth order groups in the sample. This result supports the findings of Aluja et al. (2002) that explored the interrelationships among the personality inventories. Their findings indicated that openness to experience and extraversion, as assessed in the NEO-PI-R, have a substantial positive correlation. Agreeable personality was highly and positively correlated with conscientiousness, which supports the findings and argument of Goldberg and John (1991) (as cited in Aluja, 2002), who reported that within the Big Five framework, there are somewhat different interpretations of the negative and moderate correlations between A (Agreeableness) and C (Conscientiousness) when it comes to psychoticism.

Furthermore, extraversion personality was negatively correlated with neuroticism according to sibling birth order, which is aligned with the findings of Beckmann et al. (2010), Bagherian and Mojamari (2016) and Shi et al. (2018). Extraversion was negatively related and neuroticism was positively related to the use of social services, which contrasts with the recent neuroimaging research finding that introversion/extraversion are neutrally and positively correlated. The present results contradict the findings of Bono et al. (2002), who argued that agreeableness and openness were related to reports of a relationship conflict at the individual level, in that the present findings found a weak negative correlation between agreeableness and openness and birth-order groups in the sample of Malaysian university students.

Extraversion was found to have an insignificant correlation with conscientiousness and neuroticism was not found to be correlated with agreeableness. These research findings support the argument of John and Srivastava (1999, as cited in Ode et al., 2008), who argued that the personality

traits of neuroticism and agreeableness are often, if not typically, uncorrelated. Interestingly, it contradicted Ode et al. (2008) who found that neuroticism and agreeableness interacted to predict anger and aggression in a study on the role of agreeableness in moderating neuroticism influencing anger and aggression among U.S. undergraduates. In terms of direct effects of birth order on personality traits, this study found insignificant direct effects of all birth order groups on personality traits. This finding of non-significance corroborates the research outcomes of Rohrer et al. (2015) and Keat and Mazlan (2019).

EDUCATIONAL IMPLICATIONS AND CONCLUSION

This study has shed light on the ongoing controversy in global research on the effects of sibling birth order by providing insightful Malaysian data on the issue with some recommendations and implications. The significant association found between extroversion and agreeableness across all birth order groups demonstrates that the study's respondents had highly responded to the two factors, which could well reflect their own personality inclinations. Hence, their high endorsement of the extrovert and agreeableness personality traits is a positive implication for the respondents, as this means that they are likely to get along well with foreign students in their respective higher learning institutions. Moreover, it is a good indication that Malaysian students, especially those at the university surveyed in this study, are less likely to encounter problems in building rapport and establish communication with other student groups, be it in different settings within Malaysia or when traveling abroad. Another positive implication of the results regards the tolerance among siblings and acceptance of their differences. Since these two traits (i.e., of being openminded, generous, honest and trustworthy) were found to be dominant in this sample of Malaysian students, it may imply that the prospect of fostering peaceful families and cultivating a peaceful Malaysian society looks good and promising.

Nevertheless, there are some negative implications of the “extrovert and agreeableness” personality traits. The presence of these traits may suggest that students are prone to exploring new ideas or new things and this can be considered a risky behaviour. The danger in this is that students may be hasty in trying out new things without properly looking at the risks inherent in them. According to the Big Five theory, siblings with the “extrovert” and “agreeableness” traits do well in politics, as they are sociable and charming, but may not be good leaders for their families and nations, being low in “neuroticism” (Alex, 2009). Hence, schools and universities should educate students to be well-informed and responsible risk takers.

The non-significant direct effect of birth order found in this study is congruent with previous findings in Malaysia and around the world. Overall, the results suggest that birth order may not play a significant role or exercise a serious influence on students' personality development. Arguably, the differences in Malaysian students' personality inclinations may be due to other factors, such as social or family factors. First, one critical factor is parenting styles, which may largely account for birth order effects among children. Hence, parents must be aware and educated about the influence of their parenting styles on children's growth, wellbeing and personality development. They must make every effort to provide equal care and treatment to their children regardless of the children's position among siblings. This was shown when the analysis controlled for sibship size in the model. Second, changes in birth-order personality may only happen in a family due to personal situations and interactions—

people tend to have a different set of behaviours in different situations. The strategies family members employ to solve problems tend to be related to their sibling interaction; and a given parenting style may not be applicable or appropriate outside the family system. Third, other factors, such as the nature and the non-shared experiences (i.e., personal experiences outside the family setting and disorder), exert a stronger impact on personality when there exist interactions with people outside the family context.

Additionally, the differences in sibling birth order may represent the type of personality a sibling adopts and adapts. It predicts their behaviours, movements, feelings and attitudes. In addition, it shapes who they are and what they will be. If that is the case, parenting styles will more likely influence sibling growth and work to bridge the gaps between the birth order differences of siblings. With this scenario, the findings of this study could provide psychologists, social workers, counsellors, medical health centres, policymakers, therapists and educators with a better understanding of the wide range of factors affecting their clients or students in terms of their psychological make-up and behaviour.

For teachers and educators, this understanding enables them to better comprehend and deal with their students—i.e., why students act the way they do, their cognition and intelligence, the learning or behavioural disorders they may have, their personal experiences and developmental stages, and how their background characteristics may shape their mindsets. This knowledge is critical to teachers' decision to develop interventions for any student issue occurring at school. It should also help schools to build an organic partnership with parents in raising positive, open-minded, tolerant and resilient future generations of Malaysians capable of fulfilling the multiple aspirations of the National Philosophy of Education.

RESEARCH CONTRIBUTIONS AND RECOMMENDATIONS

This study is not only a methodological contribution to research; it also contributes to the relevant body of knowledge regarding the development of personality in individuals. Among other things, the results should enhance Malaysian parents' awareness about the impact of birth order on children's personality development, and can be used to help parents understand the importance of equal treatment of all children. The results also provide information concerning the dynamics involved in building children's personality and character, which enables parents to modify their parenting styles to ensure that their children can build healthy and positive characters.

Moreover, this research plays a crucial role in understanding Asian families and the bond between parents and children. First, it plays a role by testing Sulloway's theory of birth order effects on psychological development, which has been heavily criticised by researchers for conflicting findings and inconsistency when it comes to different families. The findings of this research may yield new results that will free Sulloway of the criticisms and doubts by examining sibling birth order and its effect on personality from the Asian perspective. Second, the findings of this research suggest new directions in looking at the possibility of having three personality types by birth order, namely first-, middle- and last-born personality traits, which are different from Sulloway's birth order theory. Third, this research is significant for being carried out in a multiracial community in which Muslims are dominant with the expectation and hypothesis that cultural differences, ethnicity, religion and

background might introduce different styles of parenting that project different sibling competitions and personalities.

Notwithstanding the different criticisms levelled at Sulloway's personality theory of birth-order effects in Western countries, especially the U.S., it is untenable for the theory to be totally rejected in the Malaysian context because research in this specific area is scarce. Malaysian researchers should examine and test the effects of birth order on personality across the country's three major ethnic groups and religions. Indeed, the results necessitate the conduct of extensive further studies examining the effect of sibling birth order on personality in a wide range of contexts and settings to cover all potential aspects, because it is believed that different ethnic backgrounds and religions do influence the personality of students. By this argument, Malay students are assumed to be different from Chinese and Indian students in terms of personality traits and birth order effects. The same reasoning applies to Muslim, Christian, Buddhist and Hindu students who are expected to be distinctly different in this regard. Teachers, especially, need to have this understanding as they deal with diverse, multi-ethnic student bodies on a daily basis. Given its importance in understanding birth-order effects on personality development, the rejection of applying Sulloway's theory in Malaysia is deemed academically unwise. Due to its utility, the theory should be subjected to further testing and replication in different contexts and settings. As the results of this study should not be generalized to other private universities or student populations, further research on the same issues is also mandatory.

To gain a better perspective, future research undertakings should utilise within-family comparisons, which refer to comparing between and among children in the same family on their personality traits as a function of position among siblings. The present study was conducted using the between-family comparison technique in which the respondents were from different families. The between-family comparison technique has a limitation in that it cannot fully control for genetic differences, socioeconomic status of the family and other confounding variables. Although within-family comparisons also have their specific limitations—i.e., the measurement of personality may be affected by the family context and not be fully accurate through the description of siblings and parents—the limitations can be overcome through a careful and thorough implementation of the research procedure.

Further, it is necessary to conduct further birth-order research by using different instruments, changing the research population and increasing the sample size. It is also recommended that future studies replicate the present study to examine the consistency of the findings. Finally, future research should test the effect(s) of birth order on lifestyle choices and career paths or decisions among Malaysian university students.

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