

Examining the Effect of Birth Order on Neuroticism and Extraversion Among Adolescents and Young Adults

Mayuri Badhiye¹, Hrithika Mishra²

¹MSc Clinical Psychology, Department of Psychology CMR University, Bangalore, India

²Professor, Department of Psychology, CMR University, Bangalore, India

Abstract

This study investigates the influence of birth order on personality traits, specifically Neuroticism and Extraversion, among adolescents and young adults. A total of 120 participants aged between 14-25 years completed a survey distribution via Google Forms. The sample was evenly split into two groups: Elder children (First-born) and Younger children (Last-born), each comprising 60 individuals. The personality traits were assessed using Neuroticism and extraversion subscales of the Neo-Five Factor Inventory (NEO-FFI, Costa & McCrae, 1992). Data analysis involved the use of a two-sample Kolmogorov-Smirnov (K-S) test to compare the distribution of Neuroticism and Extraversion scores between the two birth groups. The results indicate that there is no statistically significant difference in the distribution of Neuroticism and Extraversion traits between elder and younger children. These findings contribute to understanding how birth order is not the sole influence on neuroticism and extraversion among adolescents and young adults.

Keywords: Birth order, Personality traits, Neuroticism, Extraversion.

Introduction

Personality refers to a person's characteristics and behaviors including their unique adjustments to life whilst also including their interest, and self-concept (APA Dictionary, 2015). Birth order is a term in which the order of children of a family are born (Adler, 2013b). It influences aspects of an individual, such as intelligence, responsibility, sociability, and emotional stability. Alfred Adler developed a theory in 1918, that places particular influences on their character. This current study relates to the cultural aspects of many previous studies concerning birth order and personality traits. This current study will examine the effect of birth order on specific personality traits (Extraversion and Neuroticism).

Theories of Birth order

Alfred Adler (1918) gave the birth order theory that places particular importance on the birth order in a group of siblings and how this would aid in determining their personalities. Adler believed that the family structure matters, for example, families with all boys or all girls may see differences in the personality structure that are developed compared to a mix of gender. Freud, a firstborn child himself, proposed that firstborn children were the most well-adjusted of all siblings. Kelvin Lemen's (2000), birth order theory suggested that the oldest child tends to be goal-oriented, reliable, and well-organized, child-only children

are contradictory in characteristics such as sociable/loner and impatient/laidback, and younger children tend to be charming, affectionate and attention-seeking and also tend to act without thinking.

Theories of Personality traits

Eysenck (1952) proposed that personality traits are biologically based, arguing that individuals inherit a type of nervous system affecting their adaptability. His model includes three major traits: 1) Extraversion, characterized by sociability and assertiveness, 2) Neuroticism, reflecting emotional instability and anxiety, 3) Psychoticism, involving aggressiveness and interpersonal hostility. Raymond Cattell (1965) developed the 16 Personality Factors (16 PF) model using L-data (Life records), Q-data (Questionnaire), and T-data (Objective tests). Gordon Allport (1937) considered personality is biologically determined and shaped by environment categorizing traits into cardinal, central, and secondary. The Five Factor Model or Big Five, includes 1) Openness to Experience, 2) Conscientiousness, 3) Extraversion, 4) Agreeableness, and 5) Neuroticism.

Theoretical Framework

The present study is underpinned by Alfred Adler's (1918) birth order theory and Big Five personality Theory. The hypothesis of this present study relates to the effect of birth order (Elder child and younger child) on Personality traits (Extraversion and Neuroticism).

Birth Order

According to Adler's birth order theory, parents give their firstborns more time and attention. Since they are still learning how to raise children, newlyweds may be more rigid, rule-abiding, circumspect, and occasionally even neurotic. Regardless of gender, older siblings frequently feel more devoid or jealous because, at certain times in their lives, they have witnessed another child take attention away from them. They are typically more focused on success. Firstborns experience an abrupt change in circumstances when their younger siblings enter the picture. They unexpectedly need to share their parent's attention when they grow older and become a sibling. You may think your parents look up to you and expect you to lead by example for those who are younger than you.

When compared with their older siblings, lastborns—also known to be the "babies" of the family—are frequently perceived as being more spoiled and pampered. At this point, parents are usually busier and more experienced, so they tend to be less strict in their parenting style. According to Adler's theory, younger children are typically charming, friendly, and outgoing. Known as "youngest child syndrome," they frequently feel inferior to their older siblings despite having more freedom to explore.

Personality Traits

The most widely known and used system for personality traits is called the Five Factor Model, which includes five broad traits: Openness to Experience (creativity, curiosity, and abstract thinking), Conscientiousness (thoughtful, goal-oriented and controlled), Extraversion (talkative, sociable and warm), Agreeableness (helpful, co-operative and kind) and neuroticism (uncontrolled, easily aroused and negative emotions). Many factors influence personality, such as cultural context, environment, gender, birth order, etc.

Extraversion

Extraversion is a personality trait characterized by sociability, assertiveness, enthusiasm, and a tendency to seek stimulation in the company of others. Extraverts are typically outgoing, and energetic and thrive in social situations (McCrae & Costa, 1999). Extraverts often perform well in an environment that requires

interaction and collaboration such as a team-based work setting. Eysenck (1967), suggests that extraverts have lower baseline levels of cortical arousal, leading them to seek external stimulation to achieve optimal arousal levels.

Neuroticism

Neuroticism is a personality trait characterized by emotional instability, anxiety, moodiness, and a tendency to experience negative emotions more intensely and frequently. Individuals high on neuroticism are more susceptible to psychological stress (McCrae & Costa, 1999). Individuals high in neuroticism may avoid situations that they perceive as stressful or anxiety-inducing (Bolger & Zuckerman, 1995). They may have difficulties in coping with life challenges, leading to higher risks of mental health issues such as depression and anxiety disorder (Kendler et al., 2006). High neuroticism can impact relationships and social interactions, as individuals may be more reactive to perceived criticism or conflict (Lahey, 2009).

Literature Review

It was investigating birth order effects on facets of extraversion. This study discusses whether birth order within families correlates with specific aspects of extra (Beck, Burnet, V osper, 2006). It seems to uncover any patterns or tendencies in the personality traits of extraversion based on birth order. The results indicate that birth order does not have a modest influence on certain facets of extraversion, with the firstborn often exhibiting higher levels of assertiveness compared to later-born siblings. This study explores the relationship between birth order & facets of extraversion, aiming to uncover any potential correlates between birth order within families and specific aspects of extraversion (Kamra & Singh, 2021). The findings suggest that birth order may indeed influence certain facets of extraversion, with the first-born often exhibiting a higher level of assertiveness compared to later-born siblings. This study examines the relationship between birth order and personality traits within large families (Dixon et.al, 2008). These findings suggest that birth order may significantly impact personality development, with later-borns often displaying more extroverted and agreeable traits than firstborns. Smith & Goodchild (1963) observed firstborn to be more conforming & neurotic, while Sulloway (2001), attributed the difference to sibling competition & differential parental treatment. This study suggests that birth order influences personality traits such as extraversion & neuroticism, moderated by family dynamics & individual differences. Camil (2004) presents how functional brain imaging shows that neuroticism is associated with increased activity in brain regions related to negative emotional processing. whereas, extraversion extraversion is linked to greater activation in reward-related brain regions. These findings highlight different brain mechanisms underlying these personality traits and integrate personality psychology and neuroscience. this biological underpinning of emotional reaction and regulation in relationship to extraversion and neuroticism are highlighted by this study. according to Beck, Burnet, and Vosper's (2006) investigation into the effect of birth order on various facets of extraversion, firstborns typically score higher on the trait of assertiveness & leadership, while later-born tend to be more gregarious and excitement-seeking. This study emphasizes minute effects on particular dimensions, building on easier research that links personality differences to birth order. the results advance our knowledge of how familial dynamics influence an individual's personality traits. Marini & Kurtz (2011) integrate viewpoints from inside and outside the family context as they investigate how birth order affects typical personality traits. their research sheds light on minute differences in traits like agreeableness and conscientiousness, which adds to the ongoing discussion about whether or not birth order has a significant impact on personality development. the results imply that birth order effects are slight but noticeable, indicating the need for more investigation into this area of

personality studies. Gupta (2017) investigates the impact on birth order and personality traits, citing research indicating first born frequently display consciousness and leadership abilities, while later born might be rebellious and receptive to new experiences. the review emphasizes the importance of parental involvement and family dynamics informing personality while highlighting conflicting results. overall, the research points to a small but significant influence of birth order on personality development. The family Niche Model, which contends that family dynamics affect personality development, is examined by Michalski & Shackelford (2002). this result of earlier studies on the effect of birth order have been inconsistent, frequently because of methodological issues. to give more thorough insights into how siblings' varying familial roles affect personality traits. This study uses a within-family methodology. Healey & Ellis (2007) investigate the Family Niche Model, which suggests that personality traits consciousness, and openness to new experiences are influenced by one's birth order. This research demonstrates that firstborns are typically more conscientious and later-borns are more receptive to new experiences, using a within-family methodology. This study advances our knowledge of how birth order and family dynamics influence the development of each person. Saroglou & Fiasse (2003) study how young adults from three-sibling families relate to each other in terms of personality traits, religious beliefs, and birth order. the study expands on prior research that suggests birth order may have an impact on personality development and investment and how it may affect religious beliefs. prior studies have yielded inconsistent findings. While later-borns may be less religious and more receptive to new experiences, firstborns may be more traditional and conscientious, possibly leading to higher religiosity. Using self-reports and ratings from observation, Jefferson, Herbst, and McCrae (1998) examine the connection between personality traits and birth order. Their results disprove popular beliefs that showing that birth order has only a marginally consistent effect on personality. The intricacy of the development of personality and the relative insignificance of birth order in relationship to other influences are highlighted in this work. In a meta-analysis, Philips (1998) investigates the connection between personality traits and birth order. The study summarizes research results from multiple studies emphasizing recurring themes and variance in personality traits amongst birth order positions, the finding shows a small but significant correlation, pointing to the possibility that personality development can be influenced by birth order. Ernst & August (1983) investigate how a sibling's position in the family hierarchy affects people's behavioral inclinations and psychological development as empirical. They investigate the influence of birth order on personality traits. Their study synthesizes empirical findings to explain how birth order dynamics continue to shape personality development and interpersonal interactions. Zweigenhaft & Von Ammon (2000) investigate Sullway's "Born to Rebel" theory, which connects civil disobedience and birth order. They explore whether birth order affects a person's tendency towards rebellious behavior in the Journal of Social Psyche, supporting Sulloways theory that children born later in life are more likely to defer authority figures and social norms. A large-scale meta-analysis is used by Rohrer et al. (2015) to examine the impact of birth order on personality traits. They find that there are only minor effects on the Big Five aspects of personality across studies. Their research offers an alternative explanation for individual variances in personality formation and challenges conventional wisdom regarding the influence of birth order on personality development. Sullway (1996) investigates how family dynamics and birth order affect creativity.

Research Question:

“Examining the effect of birth order on extraversion and neuroticism among adolescents and young adults”.

Research Gap:

- Most research on birth order effects is conducted in Western cultures.
- There are fewer studies on first-born children and last-born children.

Methodology

Aim: To study the effect of birth order on extraversion and neuroticism among adolescents and young adults.

Objective:

- To measure the level of extraversion among adolescents and young adults of different birth order.
- To measure the level of neuroticism among adolescents and young adults of different birth order
- To determine differences in extraversion levels among adolescents and young adults based on birth order.
- To determine differences in neuroticism levels among adolescents and young adults based on birth order.

Research Design:

This study has been designed to be carried out in a quasi-experimental method.

Hypothesis:

- H01: There is no significant effect of birth order on extraversion among adolescents and young adults.
H02: There is no significant effect of birth order on neuroticism among adolescents and young adults.
H1: There is a significant effect of birth order on extraversion among adolescents and young adults.
H2: There is a significant effect of birth order on neuroticism among adolescents and young adults.

Variables

Independent Variable (IV): Birth Order

The term "birth order" describes a child's position to their siblings at birth, including whether they are the first, middle, or last born.

Dependent Variable (DV): Neuroticism and Extraversion

Personality traits pertain to a person's abstractly considered, fairly persistent patterns of thoughts, emotions, and behaviors that are expressed in ways that are functionally consistent across a variety of situations. They are among the several smaller subcomponents of personality (Roberts, 2009).

Sampling:

• **Population**

Indian Adolescents and Young Adults aged between 14-25 years old.

• **Sample Size**

120 participants, 60 elder children, and 60 younger children.

• **Sampling Method**

Non-probability convenience, snowball sampling method.

Inclusion Criteria

- Individuals aged 14-25 years.

- Individuals who are first born in the family.
- Individuals who are last born in the family.
- The population in the sample size includes people who are familiar with English.
- The samples were collected from the Indian population.

Exclusion Criteria

- Individuals who are middle-born in the family.
- Individuals who are only children.
- Individuals above or below 14-25 years.
- The population in the sample size excludes people who are not familiar with English.

Tools:

NEO Five-Factor Inventory (NEO-FFI): The NEO-FFI (Costa, P. T., & McCrae, R. R., 1992) was designed to assess the constellation of traits defined by the Five Factor Theory of Personality. This description of the Big Five is drawn from Digman (1990), Goldberg (1992), and John & Srivastava (1999). 60 items using 5-point ratings (1 = strongly disagree to 5 = strongly agree). The factor structure used by the NEO-FFI is described as Extraversion and neuroticism.

Result

The research study focused on the effect of birth order on Extraversion and Neuroticism among adults. It was carried out using a quasi-experimental design employing the Neo Five-Factor Inventory (Neo-FFI). The sample size consisted of 120 participants, 60 elder children, and 60 younger children, in the age group 14-25 years old. Consent and demographic details were collected using the google forms, followed by the one questionnaire. The scores obtained on the questionnaires will be used to interpret the effect of birth order on Extraversion and Neuroticism among adults.

Table: 1 Gender, Employment Status, and Religion Statistics of the Participants.

	Birth order		Total (N=120)
	Younger children	Elder children	
Gender			
Male	26(43%)	31(51%)	57
Female	34(57%)	29(48%)	63
Employment Status			
Students	46(77%)	42(70%)	88
Unemployed	6(10%)	15(25%)	21
Employed	8(13%)	3(5%)	11
Religion			
Hindu	56(93%)	54(90%)	110
Muslim	3(5%)	6(10%)	9
Christian	1(1.6%)	0(0%)	1

The research includes essential demographic information, as outlined in Table 1. This demographic information encompasses Gender, Employment Status, and Religion, collectively providing a comprehensive understanding of the study’s participant characteristics.

The demographic information provides valuable insight into the background and diversity of the participants, enhancing the depth and relevance of our research findings.

Table 1 shows gender distribution in the study with 57 males and 63 females participating. It also shows participants employment status: 88 are students, 21 are employed, and 11 are unemployed. It also showed the religious affiliation of participants: 110 Hindus, 9 Muslims, and 1 Christian.

Table: 2 Descriptive Statistics of Effect of Birth Order on Extraversion and Neuroticism among Adults.

The scores of the samples (N=60 for each group) on variables Neuroticism and Extraversion for younger and elder children were subjected to descriptive statistical analysis. The mean neuroticism score for younger children is 41.37, which is higher than that of elder children, which is 37.57. This indicates that younger children tend to report higher levels of neuroticism. The median score is 40.00 for younger children and 37.00 for elder children, showing that the central tendency is slightly higher in younger children. The range of neuroticism scores is greater for younger children (49.00) compared to elder children (36.00), indicating a wider spread of scores among younger children. The IQR is the same for both groups (10.00), suggesting that similar variability is in the middle 50% of scores. Skewness for younger children is 1.291, indicating a positively skewed distribution and the kurtosis is 2.924, indicating a leptokurtic distribution (more peaked than normal). For elder children, the skewness is -0.017, indicating a nearly symmetrical distribution and the kurtosis is 0.738, indicating a distribution slightly more peaked than normal. The mean extraversion score for younger children is 42.12, which is slightly higher than that of elder children, which is 41.28. This suggests that younger children tend to be slightly more extroverted. The median scores are very close, with younger children at 42.00 and elder children at 41.50, indicating a similar central tendency. The range of extraversion scores is greater for younger children (29.00) compared to (19.00), showing a wider spread of scores among younger children. The IQR is smaller for younger children (5.00) than for elder children (6.00), suggesting less variability in the middle 50% of scores for younger children. The skewness for younger children is 1.035, indicating a positively skewed distribution and the kurtosis is 2.816, indicating a leptokurtic distribution. For elder children, the skewness is -0.257, indicating a slight negative skew and the kurtosis is -0.194, indicating a platykurtic distribution (flatter than normal).

Table: 3 This table shows the Tests of Normality for the data set

	Birth Order Sib	Statistic	Std. Error
Score Neuro	1	Mean	41.37
		Median	40.00
		Range	49
		Interquartile Range	10
		Skewness	1.291
		Kurtosis	2.924

Score Extra	2	Mean	37.57	.856
		Median	37.00	
		Range	36	
		Interquartile Range	10	
		Skewness	-.017	.309
		Kurtosis	.738	.608
	1	Mean	42.12	.692
		Median	42.00	
		Range	29	
		Interquartile Range	5	
		Skewness	1.035	.309
		Kurtosis	2.816	.608
2	Mean	41.28	.550	
	Median	41.50		
	Range	19		
	Interquartile Range	6		
	Skewness	-.257	.309	
	Kurtosis	-.194	.608	

<i>Tests of Normality</i>				
	Birth Order	Shapiro-Wilk		
	Sib	Statistic	df	Sig.
ScoreNeuro	1	.917	60	.001
	2	.982	60	.518
Score Extra	1	.927	60	.002
	2	.983	60	.580
*. This is a lower bound of the true significance.				
a. Lilliefors Significance Correction				

Figure 1: Scores of Neuroticism in younger children.

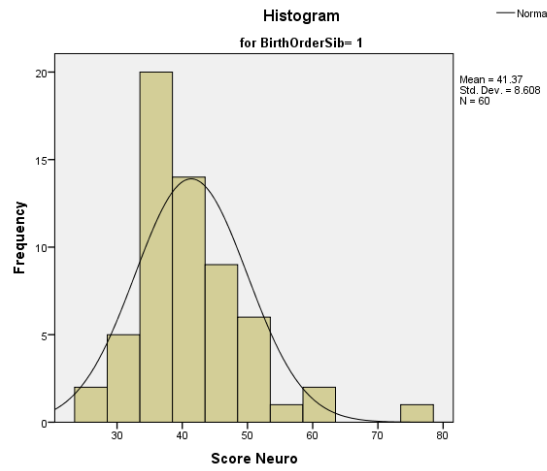


Figure 2: Scores of Neuroticism on elder children.

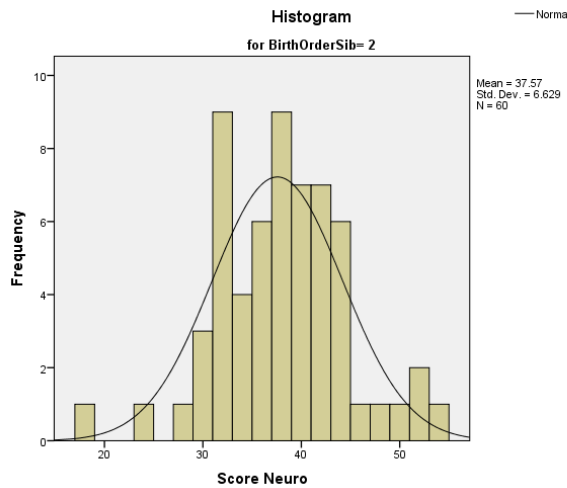


Figure 3: Scores of Extraversions on younger children.

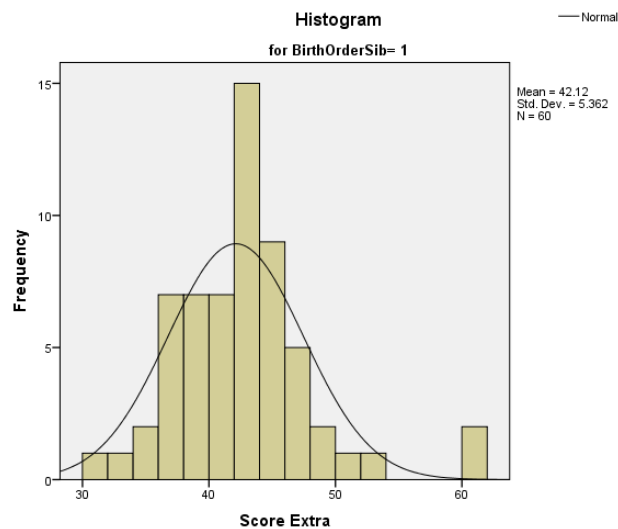


Figure 4: Scores of Extraversions on Elder Children.

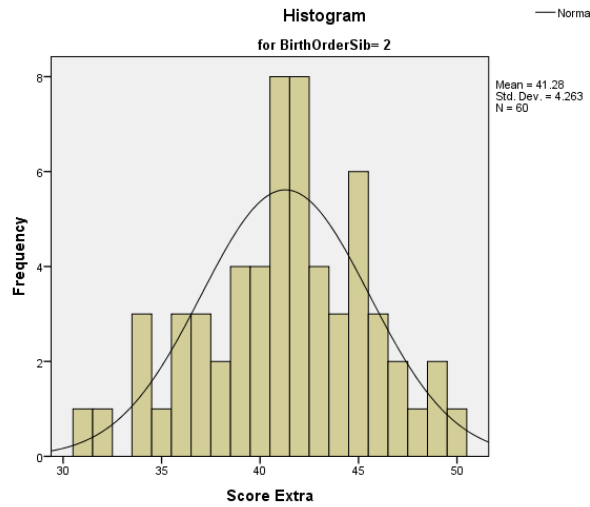


Table 2 shows the test of normality for neuroticism and extraversion using Shapiro-Wilk’s test. The results were found to be $W (df = 60) = 0.0917, p = 0.001$ for neuroticism in younger children, and $W (df = 60) = 0.982, p = 0.518$ for neuroticism in elder children. For extraversion, the results were $W (df = 60) = 0.927, p = 0.002$ for younger children, and $W (df = 60) = 0.983, p = 0.580$ for elder children. The result confirms that the population is not normally distributed for neuroticism and extraversion for younger children as the p-value is less than 0.05. However, the population is normally distributed for neuroticism and extraversion in elder children as the p-value is greater than 0.05. The null hypothesis is retained for elder children, indicating normal distribution, but is rejected for younger children, indicating deviation from normality.

Table: 4 Test of Homogeneity of Variances

<i>Score Extraversion</i>			
Levene Statistic	df1	df2	Sig.
.567	1	118	.453

For Extraversion, the significance of homogeneity of variance is $p = 0.453$. This shows that the data is homogenous for extraversion scores. The null hypothesis (H_0) that variance is equal is retained.

Test of Homogeneity of Variances			
<i>Score Neuroticism</i>			
Levene Statistic	df1	df2	Sig.
2.475	1	118	.118

For Neuroticism, the significance of homogeneity of variance is $p = 0.118$. This indicates that data is also homogeneous for neuroticism scores. The null hypothesis (H_0) that variance is equal is retained.

The result confirms that the variance is equal across groups for both Neuroticism and extraversion scores, indicating homogeneity of variance.

Table: 5 Figure 5.1: Two-sample Kolmogorov-Smirnov Test for Extraversion.

Two-sample Kolmogorov-Smirnov test / Two-tailed test

Statistic	D	Sig. (Two-tailed)	Alpha
Extraversion	0.083	0.985	0.05

An approximation has been used to compute the p-value.

H0: The two samples follow the same distribution.

To test if the two samples follow the same distribution for extraversion scores, the Kolmogorov-Smirnov two-sample test was conducted. The test statistic was $D = 0.083$, with a p-value of 0.0985. Since the p-value is greater than the significance level ($\alpha = 0.05$), we cannot reject the null hypothesis (H0). This indicates that there is no significant difference in the distribution of extraversion between the two samples.

Figure 5.2: Two-sample Kolmogorov-Smirnov Test for Neuroticism.

Two-sample Kolmogorov-Smirnov test / Two-tailed test

Statistic	D	Sig. (Two-tailed)	Alpha
Neuroticism	0.183	0.266	0.05

An approximation has been used to compute the p-value.

H0: The two samples follow the same distribution.

To test if the two samples follow the same distribution for extraversion scores, the Kolmogorov-Smirnov two-sample test was conducted. The test statistic was $D = 0.183$, with a p-value of 0.266. Since the p-value is greater than the significance level ($\alpha = 0.05$), we cannot reject the null hypothesis (H0). This indicates that there is no significant difference in the distribution of neuroticism between the two samples.

Discussion

The present study aimed to investigate the effect of birth order on neuroticism and extraversion among adolescents and young adults using a combination of Shapiro-Wilk, Levene’s, and Kolmogorov-Smirnov two sample tests. The result from the Shapiro-Wilk test indicated that the distribution of neuroticism and extraversion scores deviated from normality in younger children, with p-values of 0.001 and 0.002 respectively, whereas elder children displayed normal distribution scores for both traits, with p-values 0.518 and 0.580 respectively. This deviation from normality in younger children suggests that their personality traits are more variable and less stable, reflecting the ongoing developmental processes during adolescence.

Levene’s test for homogeneity of variance confirmed that the variance was equal across groups for both neuroticism ($p = 0.118$) and extraversion ($p = 0.453$). This indicates that any observed differences between the groups are not due to differences in variability within each group, thereby validating the use of the Kolmogorov-Smirnov (K-S) two-sample test. The K-S two-sample test results further reveal no significant differences in the distribution of Neuroticism ($D = 0.183$, $p = 0.266$) and Extraversion ($D = 0.083$), $p = 0.985$) between younger and elder children. This suggests that despite the development differences, the overall patterns of these traits are consistent across different age groups.

The impact of these findings is significant for understanding the development of personality traits in adolescents. The normal distribution of traits in elder children suggests a stabilization of neuroticism and extraversion as children grow older. In contrast, the greater variability in younger children points to the

influence of ongoing developmental changes. The lack of significant differences in trait distributions between younger and elder children highlights that, while developmental variations exist, overall trends in personality traits remain consistent.

However, the study has several limitations. Firstly, the absence of a middle child in the sample restricts the generalizability of the findings, as middle children often experience different familial dynamics that can differ from firstborns and last-borns. Secondly, most participants were adolescents whose personalities were still developing, making it difficult to generalize the result to younger children or adults. Thirdly, the relatively small sample size ($n=60$ for each group) may limit the statistical power and ability to detect minute differences between groups. Future research should include more diverse samples with middle children, employ longitudinal designs to track personality development from children through adulthood, and the sample size to provide a stronger conclusion.

The choice of the K-S two-sample test was driven by the established homogeneity of variance and lack of normality in younger children. The K-S two-sample test is a non-parametric test that compares the distribution of two independent samples without assuming normality, making it an appropriate choice for this study. Essentially, it serves as a non-parametric alternative to the z-test, providing a valid method to test the null hypothesis that the two samples come from the same distribution.

Previous research on birth order and personality has shown mixed results, with the same studies indicating that firstborns are more extroverted than lastborns, and others suggesting the opposite. The findings align with the same studies suggesting that personality traits such as neuroticism and extraversion can vary based on developmental stages and family dynamics. Sulloway (1996) proposed that younger children might develop different personality traits due to different parental investment and sibling competition. This aligns with our finding for deviated normal distribution in younger children. However, research by Domina & Roberts (2015) found a minimal impact of birth or personality traits, which aligns with our finding of no significant differences in the distribution of traits between younger and elder children.

Conclusion

The present study highlights the developmental differences in personality traits between younger and elder children, with significant implications for understating personality development. While young children show a deviation from normality distribution. The use of the K-S two-sample test provides a strong method for comparing test distributions, confirming that the overall distribution of traits does not significantly differ between the two groups.

References

1. Ashton, M. C., Lee, K., & Paunonen, S. V. (2002). What is the central feature of extraversion? Social attention versus reward sensitivity. *Journal of Personality and Social Psychology*, 83(1), 245–252. <https://doi.org/10.1037/0022-3514.83.1.245>
2. Beck, E., Burnet, K. L., & Vosper, J. (2006). Birth-order effects on facets of extraversion. *Personality and Individual Differences*, 40(5), 953–959. <https://doi.org/10.1016/j.paid.2005.09.012>
3. Birth-order effects on facets of extraversion. (2006). *Personality and Individual Differences*, 40(5), 953-959. <https://doi.org/10.1016/j.paid.2005.09.012>
4. Bolger, N., & Zuckerman, A. (1995). A framework for studying personality in the stress process. *Journal of Personality and Social Psychology*, 69(5), 890–902. <https://doi.org/10.1037/0022-3514.69.5.890>

5. Buunk, B. P., & Hoben, a. D. (2013). Birth Order and Personality: A Meta-Analysis. *Psychological Bulletin*, 1212–1248. <https://doi.org/10.1037/a0033012>
6. Canli, T. (2004). Functional Brain Mapping of Extraversion and Neuroticism: Learning From Individual Differences in Emotion Processing. *Journal of Personality*, 72(6), 1105–1132. <https://doi.org/10.1111/j.1467-6494.2004.00292.x>
7. Costa, P. T., & McCrae, R. R. (1987). Neuroticism, Somatic Complaints, and Disease: Is the Bark Worse than the Bite? *Journal of Personality*, 55(2), 299–316. <https://doi.org/10.1111/j.1467-6494.1987.tb00438.x>
8. Costa, P. T., Jr., & McCrae, R. R. (1992). Revised NEO Personality Inventory (NEOPI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual. Odessa, FL: Psychological Assessment Resources.
9. Cotterill, B. F. (2022). The Relationship Between Psychological Birth-Order Position and Personality Type. *the Journal of Individual Psychology*, 78(2), 238–256. <https://doi.org/10.1353/jip.2022.0027>.
10. Claxton, S. E., & Van Dulmen, M. H. M. (2013). Casual Sexual Relationships and Experiences in Emerging Adulthood. *Emerging Adulthood*, 1(2), 138–150. <https://doi.org/10.1177/2167696813487181>
11. Damian, R. I., & Roberts, B. W. (2015). The associations of birth order with personality and intelligence in a representative sample of U.S. high school students. *Journal of Research in Personality*, 58, 96–105. <https://doi.org/10.1016/j.jrp.2015.05.005>
12. Dixon, M. M., Reyes, C. J., Leppert, M. F., & Pappas, L. M. (2008b). Personality and birth order in large families. *Personality and Individual Differences*, 44(1), 119–128. <https://doi.org/10.1016/j.paid.2007.07.015>
13. Ernst, C., & Angst, J. (1983). Birth order: Its influence on personality. Berlin and New York: Springer-Verlag.
14. Forer, L. (1977). The birth order factor. New York: Pocket Books.
15. Gupta, T. (2017). Birth Order and Personality. *International Journal of Indian Psychology*, 5(1). <https://doi.org/10.25215/0501.014>
16. Harris, J. R. (2000). Socialization, Personality Development, and the Child's Environments: Comment on Vandell (2000). *Developmental Psychology*, 36(6), 699–710. <https://doi.org/10.1037/0012-1649.36.6.699>
17. Healey, M. D., & Ellis, B. J. (2007). Birth order, conscientiousness, and openness to experience. *Evolution and Human Behavior*, 28(1), 55–59. <https://doi.org/10.1016/j.evolhumbehav.2006.05.003>
18. Jefferson, T., Herbst, J. H., & McCrae, R. R. (1998). Associations between Birth Order and Personality Traits: Evidence from Self-Reports and Observer Ratings. *Journal of Research in Personality*, 32(4), 498–509. <https://doi.org/10.1006/jrpe.1998.2233>
19. Kaemra, T., & Singh, S. (2021). Influence of Birth Order on Personality and Adjustment in Young Adults. *International Journal of Indian Psychology*, 9(2). <https://doi.org/10.25215/0902.166>
20. Kandler, C. (2012). Nature and Nurture in Personality Development. *Current Directions in Psychological Science*, 21(5), 290–296. <https://doi.org/10.1177/0963721412452557>
21. Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist/the American Psychologist*, 64(4), 241–256. <https://doi.org/10.1037/a0015309>

22. Lucas, R. E., & Diener, E. (2001). Understanding extraverts' enjoyment of social situations: The importance of pleasantness. *Journal of Personality and Social Psychology*, 81(2), 343–356. <https://doi.org/10.1037/0022-3514.81.2.343>
23. Marini, V. A., & Kurtz, J. E. (2011). Birth order differences in normal personality traits: Perspectives from within and outside the family. *Personality and Individual Differences*, 51(8), 910–914. <https://doi.org/10.1016/j.paid.2011.07.019>
24. McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52(1), 81–90. <https://doi.org/10.1037/0022-3514.52.1.81>
25. McCrae, R. R., & John, O. P. (1992). An Introduction to the Five-Factor Model and Its Applications. *Journal of Personality*, 60(2), 175–215. <https://doi.org/10.1111/j.1467-6494.1992.tb00970.x>
26. Park, J. H., & Peter, M. D. (2008). Birth Order and Risky Adolescent Behavior. *Journal of Youth and Adolescence*, 37(3), 273–285. <https://doi.org/10.1007/s10964-007-9235-2>
27. Rodgers, J. L., Cleveland, H. H., Van Den Oord, E., & Rowe, D. C. (2000). Resolving the debate over birth order, family size, and intelligence. *American Psychologist/the American Psychologist*, 55(6), 599–612. <https://doi.org/10.1037/0003-066x.55.6.599>
28. Rohrer, J. M., Egloff, B., & Schmukle, S. C. (2015). Examining the effects of birth order on personality. *Proceedings of the National Academy of Sciences of the United States of America*, 112(46), 14224–14229. <https://doi.org/10.1073/pnas.1506451112>
29. Saroglou, V., & Fiasse, L. (2003). Birth order, personality, and religion: a study among young adults from a three-sibling family. *Personality and Individual Differences*, 35(1), 19–29. [https://doi.org/10.1016/s0191-8869\(02\)00137-x](https://doi.org/10.1016/s0191-8869(02)00137-x)
30. Smith, E. E., & Goodchilds, J. D. (1963b). Some personality and behavioral factors related to birth order. *Journal of Applied Psychology*, 47(5), 300–303. <https://doi.org/10.1037/h0040650>
31. Sulloway, F. J. (2001). Birth Order, Sibling Competition, and Human Behavior. In *Studies in cognitive systems* (pp. 39–83). https://doi.org/10.1007/978-94-010-0618-7_3
32. Tucker, C. J., McHale, S. M., & Crouter, A. C. (2001). Conditions of sibling support in adolescence. *Journal of Family Psychology*, 15(2), 254–271. <https://doi.org/10.1037/0893-3200.15.2.254>
33. Zweigenhaft, & Ammon. (2000). Birth order and civil Disobedience: A Test of Sulloway's "Born to Rebel" Hypothesis. *The Journal of Social Psychology*, 140(5), 624-626., 140(6), 624–626. <https://doi.org/10.1080/00224540009600510>