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Research Paper

Exploring the Impact of Birth Order on Locus of Control

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ABSTRACT

This study investigates the disparities in locus of control between two distinct groups, providing insight into the complex correlation between group affiliation and this essential psychological construct. The application of statistical tests uncovered insignificant disparities in the means of locus of control between the groups, while assuming equal variances. However, in cases where assumptions about variances were not made, it was suggested that there may be a divergence in the means, which calls for further examination using a more substantial sample size. Furthermore, irrespective of the assumptions regarding variance, there were no significant disparities observed in the mean locus of control among the groups. As a result, the hypotheses pertaining to these disparities were disproven. The study enhances our comprehension of variations in locus of control among different groups, although limitations including sample size and unaccounted confounding variables are acknowledged. It is recommended that future research endeavors replicate these results with other participant groups and examine plausible mediators or moderators of the effects of group affiliation and locus of control. To summarize, this study highlights the value of meticulous statistical analysis and the necessity for additional research to fully grasp the connection between group affiliation and locus of control, notwithstanding the lack of notable discrepancies.

Keywords: *Birth Order, Locus of Control*

The way we look at our life and future are influenced by a vast array of factors. Everything from our familial conditions, to our childhood experiences, from our personality types, to our religiosity, from emotional quotient to our social learnings affect how we perceive the events happening to us. Expanding on the familial variables, a very influential but often overlooked variable is the birth order. Birth order is the ordinal position of a child. Recognizing the importance of birth order, Alfred Adler, in his study on personality defined specific personality types based on the birth order of the person.

Locus of Control

Locus of control is the level of influence people believe they exert over the events of their lives. According to psychologist Philip Zimbardo, it is "a belief about whether the outcomes of our actions are contingent on what we do (internal control orientation) or on events outside our personal control (external control orientation)."

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Julian Rotter, in 1954 suggested the influence of reward and punishment in behaviour. This so explained how the consequences of our actions are a predictor of likely and unlikely behaviours.

Locus of control should not be confused with attributional style. While locus of control is a personality variable with respect to generalized expectancies about **future**, attributional style refers to how individuals attribute events of the **past**. Locus of control is also one of the four core self-evaluation parameters along with neuroticism, self- esteem, and self – efficacy.

Eventually the research created three separate categories- extrinsic, intrinsic, and chance locus of control to classify people. People with extrinsic locus of control believe their lives are a consequence of or heavily influenced by the actions of others. They believe their lives are decided by the authority of others. People with chance locus of control believe the events and their results are a due to the influence of uncontrollable variables like fate, luck or chance. People with an intrinsic locus of control harbour a firm belief that the trajectory of their lives is decided by their actions, decisions, and efforts.

In simplistic terms, having an Internal locus of control can also be referred to as "self-agency," "personal control," "self-determination," etc. To put it simply, possessing an internal locus of control is also known by words like "personal control," "self-agency," "self-determination," etc. Studies have revealed the following patterns:

- Men are typically more inward-looking than girls.
- People tend to become more inward as they age.
- Individuals in higher positions within an organization typically exhibit greater internal

Birth Order

Alfred Adler was a physician and psychologists from Austria who formed the school of individual psychology. Individual psychology or Adlerian Psychology, is a theory of human behaviour and a therapeutic approach that encourages individuals to make positive contributions to society as well as to achieve personal happiness. It focuses on understanding "the experiences and behaviour of each person as an organized entity." (Sperry, J., Sperry, L. (2020)).

Adler also worked on the concept of inferiority and the inferiority complex which heavily influenced his work on personality and personality formation. Adler described specific personality types for each ordinal birth order by listing the traits specific to each birth orders. Adler wrote, "It is not, of course, the child's number in the order of successive births which influences his character, but the situation into which he is born and the way in which he interprets it." (Eckstein et al., 2010, p. 409). Adler also emphasized the complex interplay of other factors that work together to influence personality along with ordinal birth order. These were studied in detail in subsequent researches. Some of them are,

- How people perceive their birth order is more influential than their actual, ordinal birth order. (Ansbacher and Ansbacher, 1956)
- Since Adler gave this theory in 1920s and 1930s when death of children was not so uncommon, the death of a sibling also became one of the factors which caused dissonance between the actual and the perceived birth order.
- If the eldest child is suffering from disability, the second born may display more leader ship traits generally linked with the first birth order.

- If the family has a significant age difference among groups of children, the eldest in the latter group might possibly display the characteristics of a first born.
- Similar differences can be seen in twins as well. (Ansbacher & Ansbacher, 1956)
- The gender of the first born affects their roles in the family and thus their perceived birth orders. It is commonly seen if the first born is a female, the second born male automatically assumes a position of authority and leadership in the household which is typically linked with the first birth order. (Ryckman, 2013).
- Families with many same sex children except for one observe either an abundance of or an extreme shortage of the traits traditionally linked to the dominant sex in the child with the unique sex. This can be observed when most commonly in females developing hyper-feminine traits or hyper-masculine traits if raised in a male dominant household. (Ryckman, 2013).
- Though his original theory hypothesized that the birth of a sibling within 3 years of the person's birth has more profound impact on personality. This hypothesis was later proven wrong by research conducted by Greene RL. and Clark JR. (Greene, R. L., & Clark, J. R. (1970)

Adler also cited the phenomenon of *sibling de-identification* as a reason for why we develop specific personality types. Children with siblings often work, either consciously or unconsciously, to distinguish themselves from their sibling. This search for a personality separates from their sibling in turn grants them attributes, behaviours, and tendencies unique to them, in turn defining their personality. A commonly seen model of this is older siblings serving as role models and younger siblings imitating them. (Eckstein & Kaufman, 2012).

Therefore, the interplay of perceived birth order, de-identification, and modelling and imitation often result in the creation of specific personality types for each rank of birth.

Adler gave five distinct categories of birth order with specific traits based on the circumstances of their birth and development through their childhood.

First born child

The first borns or the oldest children receives all the parental attention without competition till the birth of their sibling. The birth of the second sibling brings in the feelings of a "dethroned monarch" since the parental attention gets divided and the oldest no longer remains the sole focus of the parents. (Ryckman,2013). This feeling of being "dethroned" may bring about, The age gap between the siblings also plays an important role. If its three or more years, a routine has been established and the older sibling would take time adjusting to the new routine. Children need proper adaptation to prevent the development of neurosis, but a proper nurturing upbringing can cause them to play the role of another caretaker by acting as the third parental figure. (Ryckman, 2013).

While older children understand the importance of power and authority, they often become politically conservative and conforming. They lean into order, structure and adherence to norms and rules. They may also be past-oriented due to their fixation with the time when they were the centre of attention. (Ansbacher and Ansbacher, 1956)

Second born child

Since this child shares attention with their sibling since birth, they are more cooperative. They also tend to be more cooperative due to the constant urge to keep up with the older

sibling. This trend tends to continue in their careers as well. They may become so driven by this competition that they develop a habit of setting unrealistic goals for themselves ultimately bringing in failure.

It was also observed that second born children are much more likely to resist authority and believe that no power can be overthrown. (Ryckman, 2013)

The Middle child

Due to the existence of both an older and a younger sibling, this individual is unable to experience the privileges and attention attributed to being the first or lastborn. Consequently, individuals occupying the middle child role may perceive a sense of exclusion within their families. Though they might feel less loved, they may successfully overcome these feelings through well-developed interpersonal skills and enhanced self-esteems. (Stewart, 2012)

Youngest child

Since this child is the last born, these are often pampered little babies of the family, receiving most of the family's attention. This can sometimes result in excessive dependency on others for support and protection. (Ryckman,2013).

Even though they constantly compete with the older sibling, the increased attention they receive can cause them to develop extraordinarily and excel in their endeavours. (Ansbacher and Ansbacher, 1956)

Since they are used to being pampered, they make seek easy solutions to problems and methods to coax or charm others. They are mostly seen as the most popular out of the different birth orders. (Ansbacher and Ansbacher, 1956)

It was also seen that youngest born children were easily discouraged in their tasks and not establish socially useful roles with their siblings. (Steward, 2012) Failures and mistakes are then used to find significance among family members.

While this is observed, Adler also commented on the youngest children who overcome this competition and become extra successful due to the added family support. In contrast, youngest children have the maximum probability of becoming the problem child if spoiled.
Ansbacher and Ansbacher also theorized that youngest children never gain independence with no single identifiable ambition due to their desire to excel in everything. They may also suffer from extreme inferiority complex. (Ansbacher and Ansbacher, 1956)

Only child

The only child receives undivided attention throughout their lives which most likely causes them to be pampered. (Ryckman,2013) This can extend as feelings of dependence and entitlement outside the family as well in some while some may feel smothered by this attention, and seek independence and autonomy. (Steward, 2012)

Since there is no sibling in the picture, the competitive spirit often gets directed towards their fathers as their mothers continue to pamper them. This can lead to a desire to capture mother's attention full time whilst trying to remove the father from the scene. Parents who are expected to have more children are often pessimistic. Such children grow up in an anxiety-filled atmosphere impeding their growth. (Ansbacher and Ansbacher, 1956). If the

only child hails from a household where the parents never wanted children, they grow up in a state of active rejection or lifelong regret. (Ryckman, 2013)

REVIEW OF LITERATURE

- **According to Falbo (1981)** the oldest and only born children have a developed internal sense of responsibility due to often being put in charge with no other sibling to pass the blame on to.
- **Beck B. L., Brown K., (2003) studied the birth order and locus of control** and concluded no statistically significant difference was observed between firstborns and later borns with reference to locus of control. The data collected indicated that participants had an internal locus of control regardless of their birth order. Though the researcher, did state that the results might have been biased due to the data being collected at the university of natural health sciences where the participants had mostly similar core beliefs when compared with the general population.
- **Chandra Shekhar and Rajinder Kumar (2014) in Jammu titled Locus of Control Across Gender and Birth Order** with the objective of determining the gender difference and birth order difference in locus of control of first year college students. The Hindi version of the Rotter's scale by Kumar and Srinivas was used and scores were analysed to conclude that while females had a more external locus of control, the difference in locus of control due to birth order was significant.
- **Culver, C.M., & Dunham, F. (1969) studied Birth order and spatial-perceptual ability: negative note. Perceptual and Motor Skills.** The findings centered on the examination of scores related to locus of control and birth order did not offer substantial backing for the previously documented connections.
- **David Lester (1992) conducted a study on college students titled Birth order and psychological health: a sex difference** and concluded that first-born males and last-born females exhibited elevated levels of self-esteem and reduced levels of irrational thinking, in contrast to last-born males and first-born females, as indicated by the data.
- **Eisenman and Platt (1968), Moran (1967) and Warren (1966)** have concluded in their studies titled Birth order and sex differences in academic achievement and internal-external control, Notes, and comments: Ordinal position and approval motivation. Journal of Consulting Psychology and Birth order and social behaviour respectively, that first-born adults are more susceptible to social pressures which in turn makes them more dependent than the later-borns while **Crandall, Katkovsky and Crandall (1965) and Macdonald (1971) in their studies** Children's beliefs in their own control of reinforcements in intellectual academic achievement situations and Birth order and personality conclude the opposite is true.
- **H.S. Eswara (1978) conducted research in Mysore titled Birth Order and Internal-external locus of control** on 89 male participants. It included 26 first borns, 44 middle borns and 19 last borns. It was found that while the difference between first and last borns was not significant, the difference between the middle borns and the last borns when combined and compared to first borns was significant.
- **Hansson et al (1978) and Howrath (1980)** discovered that children with no siblings had a greater sense of responsibility than children with siblings.
- **Harshita Chaurasia and Navya M. Patel (2023) conducted a study to examine the role of birth order in personality among young adults** by examining the type A/B personality type of 150 individuals aged 18 to 25 years. Data was analysed using

ANOVA and it was concluded that birth order had no significant effect on personality type.

- **Heiblim R. (2006) conducted a correlational study of the relationship between birth order and individual's locus of control.** It was found that while no significant correlation was uncovered between locus of control and birth order, the middle-born participants demonstrated the largest number of external locus of control and the last borns had the maximum amount of internal locus of control. Also, it was also emphasized that the small sample size of 50 and restricted external validity might have served as a limitation for the study. It should also be notes that the participants were all adults from the same region belonging to the same university which might also serve as a factor influencing the result.
- **Hughes B., (2005) published research titled birth order and locus of control revisited: sex of siblings as a moderating factor.** According to the study, there was no significant difference in the locus of control ratings between first-born persons and others. The effect of sibling sex on locus of control was, however, mitigated by birth order, with first-borns with same-sex siblings scoring higher. There was more of an external center of control. Other participants' locus of control was unaffected by their sibling's gender. Additional investigation revealed no individual differences, despite the results being statistically significant. Because most of the sample consisted of female university students, generalization was limited. Including a range of sex compositions should improve the findings' generalizability to larger populations.
- **Kohn, M. L., & Schooler, C. (1969) studied the Class, occupation, and orientation.** The study reported no relationship between birth order and "perceptual flexibility" or "sense of control over fate" among males.
- **Lackie (1984)** concluded that while only children felt the intense pressure of responsibility towards their families, the children with siblings related more with the feeling of being infantilized.
- **Mukherjee H., and Mukherjee P. (2014) focused on locus of control, birth order, residence, and general well-being in the population of Tripura.** One of the many conclusions drawn from the research was that locus of control and birth order interacted with and greatly influenced the general well-being of the sample population.
- **Nowicki and Roundtree (1971) reported** that there is no significant association between family ordinal position and a generalized locus of control orientation among a sample of twelfth-grade participants.
- **Payal Banerjee (2023) conducted research in Bengaluru titled Effect of Birth Order on Locus of Control among Boys** with the objective of finding the locus of control for boys with and without sibling. The results concluded that boys with siblings mostly had an internal locus of control while those who did not had an external locus of control. Moreover, first born boys had external locus of control while later born boys had a more internal locus of control.
- **Philips and Philips (1994)** discovered that only children tend to attribute their job performance with internal factors when compared to children with siblings.
- **Robinson, J.P. 9 Shaver, P. (1974) conducted research on Measures of social psychological attitudes** which addressed the antecedent factors that influence the development of internal and external control orientations. According to the research findings, individuals with internal and external control orientations encountered distinct childrearing practices during their upbringing. They also found that the developmental variances in locus of control orientations may be significantly

influenced by the quality and quantity of interactions with the environment during infancy.

- **Roodin, P.A., Broughton A, and Vaught, G.M. (1974), conducted a study on Effects of Birth Order, Sex, and Family Size on Field Dependence and Locus of Control.** It was concluded that the study failed to uncover any relationship between birth order and family size on field dependence or internal-external locus of control.
- **Schildhaus (1974)** found a high need for social approval and external locus of control in first-born children whereas **Newhouse (1974)** found no significant difference between locus of control of first- and later-born 9- to 10-year-old children.
- **Schniederjan P. (1975) studied the Effect of Birth Order and Family Size on Children's Locus of Control.** The study findings indicate that there is no significant variation in the generalized locus of control orientations among middle school students with certain specific ordinal positions from both small and large families.
- **Sears, R.R. (1950) studied the Ordinal position in the family as a psychological variable** which suggested that a relation exists between child-rearing practices and ordinal positions.
- **Thomas S. L. (2021) conducted research on the impact of birth order and locus of control on life satisfaction** where she discovered that even though a significant mean difference in life satisfaction was observed between first- and last-born females, no such difference was seen among the birth order categories among males. Furthermore, it was concluded that while locus of control has an impact on the level of life satisfaction, birth order does not. Though it remains important to state that the stress prevalent conditions during the global pandemic when the research took place along with the small sample size of 30 families (i.e. 90 siblings), restricted accessibility in data collection and the use of tedious self-report measures might have biased the research conclusions.
- **Walter D A., and Ziegler C.A. (1980) studied the effect of birth order on locus of control** and discovered that first-borns have a more external locus of control than later borns siblings but with certain qualifications. The difference was the most pronounced between first and middle borns with the middle borns being more internal. This has been commonly attributed to parental attention during child rearing. This has been used previously as an explanation for all contradictory findings as well. It should be acknowledged that the sample population utilized in this study consisted of large families, with the average number of siblings being 4.1 and some households having as many as 6 siblings. It is likely that the locus of control in first and last borns is influenced by parental attention in large families, although there is not any direct evidence to support this statement.

Rationale

The above literature proves that the research to find the impact of birth order on personality and locus of control gets reawakened time to time. According to Claxton (1994), this may be due to the ongoing nature-vs-nurture debate or the constant inconsistent findings. While no clear conclusions have been drawn yet, findings both supporting and refuting the relationship have been found. The theory of birth order suggests that an individual's position in their family (such as being the firstborn, middle child, or youngest) can have a substantial impact on their development of personality. By analysing the impact of birth order on locus of control, we can enhance our comprehension of the interaction between family dynamics and an individual's perceptions regarding control over their own life.

The concept of locus of control pertains to an individual's perception regarding the degree to which they can exert influence over events occurring in their lives. Having a thorough comprehension of how birth order impacts locus of control can offer valuable insights into the psychological growth of individuals in various birth order positions. The order in which individuals are born can have an impact on how they perceive themselves in relation to their siblings and other family members. Examining the impact of birth order on locus of control can offer valuable insights into how individuals perceive themselves in relation to others within the familial setting and how this perception shapes their views on control and accountability. Understanding the correlation between birth order and locus of control can yield practical ramifications for the fields of parenting, education, and counselling. Parents and educators can utilize this information to effectively customize their strategies, taking into consideration the distinctive necessities and attributes of children, depending on their birth order position.

The concept of birth order has consistently captivated the attention of scholars in the fields of psychology and sociology. Exploring its impact on the locus of control represents a valuable contribution to our overall comprehension of human behaviour and development. By conducting an analysis of this association, researchers can make a valuable contribution to the current body of literature and theories pertaining to personality and family dynamics. Conducting a comprehensive study on the influence of birth order on locus of control holds the potential to enhance our comprehension of individual disparities and the determinants that shape personality and beliefs concerning control over one's life.

The researchers have also cited that the small number of participants could very well act as a limitation affecting the generalizability of the finding. Researching the impact of birth order on locus of control yields valuable insights into the formation of personal traits and beliefs within the family unit.

Moreover, the studies conducted in India have been confined to a specific a region and thus, a specific population thus implementing a subconscious bias.

Thus, due to the various inconclusive conclusions and the possible practical applications, this topic shows potential.

METHODOLOGY

Objective

- To examine the influence of birth order on the locus of control
- To examine the gender differences in the locus of control of the same birth order.

Hypothesis

- **H1-** First-borns will show a significant internal locus of control as compared to other birth orders.
- **H2-** Last-borns will have a significant external locus of control as compared to first-borns.
- **H3-** First-borns males will have a significant internal locus of control while first-born females will have a significant external locus of control.

Variables

- **Independent variable-** Locus of control

- **Dependent variable-** birth order, gender

Operational Definition

Locus of control: Locus of control or the internal-external control of reinforcements describes the degree to which an individual believes that reinforcements are contingent upon his own behaviour.

Sample

- **Sampling technique: -** convenience sampling
- **Sample size: -** 227 samples with 50 eldest siblings, 69 middle siblings, 94 youngest siblings and 16 only children.

Inclusion and Exclusion criteria:

INCLUSION	EXCLUSION
Age group – 18 to 30	Age group below 18 or 30 years
Indian population	Non-Indian citizens
Undergraduates	Educational qualification below a high school diploma
People well-versed in English language	People not knowing the English language

Tools

Rotter's scale for locus of control

Rotter's locus of control scale has an immediate relevance as a conceptual tool for understanding the nature of client's dysfunction and the reasoning behind the varied abilities of clients to utilize intervention. It is also valuable clinical tool. It also provides a means to measure individual differences while measuring the extent to which reinforcement is a consequence of one's own behaviour or of forces like "chance", "fate" or "powerful other".

The Rotter's I-E scale was developed based on the contributions of Phares, James, Liverant, Crowne, and Seeman. It is a 29-item forced choice instrument with 23 items are scored, with each alternative keyed as belief in internal or external. High score indicates an external locus of control whereas a low score depicts an internal locus of control. Chance locus of control cannot be measured through this scale. It has also been translated into a Hindi version to be used on a Hindi speaking population.

The Hindi version of the scale was administered on a population of 500 undergraduate students aged 18 to 25 years (mean age 21.24 years) selected randomly. The test-retest reliability was obtained by readministering the test on the 345 available subjects after a span of 4 weeks.
The index of reliability for split reliability was **0.88** and for test re-test reliability was **0.85**.

Procedure

This study utilized a self-report questionnaire which comprised Rotter's (1966) 29-item Internal/External Control Scale and a fundamental demographic page. The demographic page records details such as gender, age, family type, and birth order. This examination focused on the descriptive and distribution components of the questionnaire in the study. The study focused on as the independent variables, specifically the birth order positions, including firstborns, middle borns, younger siblings, and only children. The personality score of the participant was considered as the dependent variable, which was assessed using Rotter's

(1966) Internal/External Control Scale. In total, 229 undergraduate students from Kanpur and Lucknow areas of Uttar Pradesh, India responded to the questionnaire sent out in the form of google forms.

Among these 229 participants, 50 were eldest children,69 were middle children, 94 were youngest children and 16 were only children. SPSS 10.0 computer was used to analyse the data.

RESULT

Hypothesis 1

Table 1 Results of Independent Samples t-Test Comparing Group Means for Locus of Control of elder children and later born children

Group Statistics					
	birth_order	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
locus_of_ control	1	47	11.9149	2.91793	.42562
	2	179	11.1508	2.44826	.18299

	Levene's test for equality of variance		**t-test for equality of means**						
	F	**Sig.**	**t**	**df**	**Sig.(2-tailed)**	**Mean difference**	**Std. error difference**	**955 confidence interval of difference**	
								lower	**upper**
Equal variance assumed	2.125	0.146	1.827	224	0.069	0.76406	0.41824	-.06012	1.58824
Equal variance not assumed			1.649	64.012	0.104	0.76406	0.46329	-.16148	1.68959

CI= Confidence Interval

Hypothesis 2

Table 2 Results of Independent Samples t-Test Comparing Group Means for Locus of Control of last born children and elder born children

Group Statistics					
	birth_order	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Locus_of_ control	1	47	11.9149	2.91793	.42562
	2	94	11.2128	2.75475	.28413

	Levene's test for equality of variance		**t-test for equality of means**						
	F	**Sig.**	**t**	**df**	**Sig.(2-tailed)**	**Mean difference**	**Std. error difference**	**955 confidence intervals of difference**	
								lower	**upper**
Equal variance assumed	0.224	0.636	1.399	1.39	0.164	0.70213	0.50196	-.29034	1.69460
Equal variance not assumed			1.372	87.536	0.174	0.70213	0.51175	-.31494	1.71920

Hypothesis 3

Table 3 Results of Independent Samples t-Test Comparing Group Means for Locus of Control elder born males and elder born females.

Group Statistics					
	birth_order	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
locus_of_ control	1	30	11.7000	2.97287	.54277
	2	17	12.2941	2.86716	.69539

	Levene's test for equality of variance		**t-test for equality of means**						
	F	**Sig.**	**t**	**df**	**Sig.(2-tailed)**	**Mean difference**	**Std. error difference**	**955 confidence intervals of difference**	
								lower	**upper**
Equal variance assumed	0.147	0.703	-.667	45	0.508	-.59412	089121	-2.38910	1.20086
Equal variance not assumed			-.673	34.391	0.505	-.59412	0.88213	-.2.38608	1.19785

For the first hypothesis, the mean of the eldest borns was compared with the mean of the latter borns. Based on the results of Levene's test for equality of variances, the assumption of equal variances was not statistically significant, F(1, 224) = 2.125, p = .146. Therefore, the assumption of equal variances was upheld.

Regarding the t-test for equality of means, the assumption of equal variances was used, where the t-value was 1.827 with 224 degrees of freedom, and the two-tailed p-value was .069. When the assumption of equal variances was not met, the t-value was 1.649 with 64.012 degrees of freedom and a p-value of .104.

In both cases, the mean difference between groups (locus_of_control) was .76406, with a standard error of .41824. The 95% confidence interval of the difference ranged from -.06012 to 1.58824 for equal variances assumed, and from -.16148 to 1.68959 for equal variances not assumed.

For hypothesis two, the mean of the last borns was compared to the mean of the first borns. Based on the results of Levene's test for equality of variances, the assumption of equal variances was upheld as the test was not statistically significant, F(1, 139) = .224, p = .636.

Regarding the t-test for equality of means, when assuming equal variances, the t-value was 1.399 with 139 degrees of freedom, and the two-tailed p-value was .164. When equal variances were not assumed, the t-value was 1.372 with 87.536 degrees of freedom, and the p-value was .174.

In both cases, the mean difference between groups (loc) was .70213, with standard error differences of .50196 and .51175 respectively. The 95% confidence intervals for the difference in means ranged from -.29034 to 1.69460 when equal variances were assumed, and from -.31494 to 1.71920 when equal variances were not assumed.

For hypothesis three, the mean of the eldest born males was compared to the eldest born females. ased on the results of Levene's test for equality of variances, the assumption of equal variances was upheld as the test was not statistically significant, $F(1, 45) = .147$, $p = .703$.

Regarding the t-test for equality of means, both when assuming equal variances ($t(45) = -.667$, $p = .508$) and when equal variances were not assumed ($t(34.391) = -.673$, $p = .505$), there were no statistically significant differences in means of locus of control between the two groups.

The mean difference between groups for both assumptions was -.59412, with standard error differences of .89121 and .88213 respectively. The 95% confidence intervals for the difference in means ranged from -2.38910 to 1.20086 when equal variances were assumed, and from -2.38608 to 1.19785 when equal variances were not assumed.

Interpretation

Based on these results, there was no statistically significant difference in the means of locus of control between the two groups when assuming equal variances ($t(224) = 1.827$, $p = .069$). However, when equal variances were not assumed, the difference approached but did not reach statistical significance ($t(64.012) = 1.649$, $p = .104$). Therefore, there is tentative evidence to suggest that the means of locus of control may differ between groups, but further investigation with a larger sample size is warranted to confirm this finding**.** Thus, hypothesis one is rejected.

The results indicate that there were no statistically significant differences in means of the variable loc between the two groups, regardless of whether the assumption of equal variances was upheld or not (equal variances assumed: $t(139) = 1.399$, $p = .164$; equal variances not assumed: $t(87.536) = 1.372$, $p = .174$). Therefore, it seems that the groups did not significantly differ in terms of the loc variable and hypothesis two was rejected.

Based on these results, there were no statistically significant differences in locus of control means between the two groups, regardless of whether the assumption of equal variances was upheld or not. Therefore, it appears that the groups did not differ significantly in terms of locus of control. Thus, hypothesis three is rejected.

DISCUSSION

The statistical tests' findings, assessing the disparities in locus of control between the two groups, offer significant insights into the relationship between these groups and the underlying psychological construct. The examination demonstrated that there was no statistically significant disparity in the averages of locus of control between the two groups under the assumption of equal variances. However, in cases where equal variances were not assumed, despite not achieving statistical significance, a hint emerged that the means of locus of control may differ between the groups. This discovery highlights the significance of including variance assumptions in statistical analysis. It also suggests that conducting a more extensive study with a larger sample size may be necessary to validate the potential disparities in locus of control between the groups. Additionally, the analysis results also demonstrated that there were no statistically significant differences in the means of the variable "locus of control" between the two groups, regardless of whether the assumption of equal variances was upheld or not. This indicates that there was no significant difference among the groups regarding their locus of control. The hypotheses pertaining to the

distinctions in locus of control between the groups were ultimately refuted, leading to the rejection of said notions.

These findings may have been due to several factors. Factors like the socio-economic status, parental influence, and cultural background may have acted as confounding variables and changed the course of the research. While efforts were made to account for assumptions in statistical tests, the assumption of equal variances was not always met. This could affect the accuracy of the results and interpretation of differences between the groups. The generalizability of the study's findings may be restricted due to the particular demographics and characteristics of the sample population. Additional replication with a greater range of samples is imperative in order to establish the wider relevance and validity of the findings. The study did not investigate potential factors or mechanisms that could potentially impact the correlation between birth order and locus of control. The exploration of these factors may offer a more comprehensive insight into the intricate dynamics at work, thereby enhancing our comprehension of the fundamental mechanisms involved. The cross-sectional design of the study restricts its capacity to definitively establish causality or ascertain the direction of the relationship between birth order and locus of control. Longitudinal studies have the potential to offer an enhanced understanding of the interplay between these factors as time progresses.

The study's findings enhance our comprehension of the potential variations in locus of control among different groups. However, it is crucial to recognize and address the constraints of the study, such as the sample size and the unaccounted potential confounding variables. unequal variances assumed) can affect the results of the analysis. The significance of strong statistical analysis in research is underscored by the inclusion of (not presumed). In order to improve the generalizability of the results, future studies could undertake the task of replicating these findings with larger and more diverse samples. Furthermore, investigating potential moderators or mediators in the correlation between group membership and locus of control could yield valuable information regarding the underlying mechanisms involved. In summary, despite the lack of significant disparities in locus of control between the two groups, the findings propose the need for additional research to comprehensively comprehend the association between group affiliation and locus of control. These findings make a valuable contribution to the extensive body of literature concerning individual variances in psychological constructs. They also underscore the importance of meticulously considering statistical assumptions during data analysis.

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Conflict of Interest

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