

# The Association Between Birth Order & Attachment Style

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## Abstract

This study explores the potential influence of birth order on individuals' attachment styles, situated within the framework of attachment theory. The research investigates the correlation between attachment styles and sibling birth order, focusing on attachment orientations that develop during childhood. Attachment is defined as an individual's relationship orientation and response to relationship aspects, categorized as secure, avoidant, anxious-ambivalent, and disorganized-disoriented (Ainsworth et al., 1978; Bowlby, 1959; Miller, 2022). Sibling birth order is considered in relation to an individual's birth position (e.g., first-born, second-born, etc.). The paper comprises sections such as a literature review, outlining previous research, a theoretical foundation discussing attachment theory and its styles, and a research methodology detailing the research question, data analysis, and project management plan. The study aims to provide insights into the connection between birth order and attachment styles, contributing to the understanding of attachment theory's applicability in Western contexts.

## The Association Between Birth Order & Attachment Style

The topic of study for this paper is how birth order can influence an individual's attachment style. Our research aims to uncover a potential correlation between these two variables. Attachment theory is quite prevalent in the realm of social psychology, and we hope to provide more research that can be applicable to the use of this framework within a Western context.

## Variable Definitions

To develop our research and understand current literature, it is important to define the two main variables: attachment and sibling birth order. Attachment refers to the style of attachment an individual has in regard to others, which is typically developed during childhood, but not always stable (Miller, 2022). It describes relationship orientation and how an individual responds to aspects of their relationships, such as intimacy or proximity (Miller, 2022). Individuals can be categorized into one of four styles, which will be further described in the theory section: secure, avoidant, anxious-ambivalent, and disorganized-disoriented (Bowlby, 1959; Ainsworth et al., 1978). For the purposes of this research, we considered attachment development in childhood to determine the influence of caregiver treatment and how this differs between siblings. This introduces the second variable, sibling birth order. This refers to the order of an individual's birth (e.g., first-born, second-

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born, etc.). For the purposes of this research, we also examined the number of siblings an individual has (e.g., single child, one sibling, twin set, etc.) in relation to birth order.

### **Paper Outline**

The following paper is divided into various sections to best describe what our research will entail. Firstly, there is a literature review that analyzes previous research conducted on birth order and attachment theory, as well as other topics such as caregiver behaviour and sensitivity, and outcomes of certain attachment styles. This section situates the context of our research and provides an understanding of the limitations of past research. To continue, we describe the guiding theory of our research, outlining John Bowlby and Mary Ainsworth's contributions to attachment theory, providing an overview of the different attachment styles (Bowlby, 1958; 1959; Ainsworth et al., 1978).

Additionally, in the research methods section, we outline our research question, which is: how does one's birth order affect their attachment style? This section communicates our research process, as well as any ethical issues or other challenges that arose during our research. It also outlines our data analysis process, followed by our project management plan, including the division of tasks amongst group members. The results section will include the participant demographics and statistical results about attachment, and the discussion section will interpret these results. Finally, we will conclude by providing an overall summary of our research, and an outline of the limitations and significant insights within our research.

### **Theoretical Basis**

It is important to recognize the basis for attachment theory and the main attachment styles to understand how they are related to sibling birth order. This section references the key theorists' John Bowlby and Mary Ainsworth and their framework of the main attachment styles: secure, avoidant, and anxious-ambivalent (Bowlby, 1958; 1959; Ainsworth et al., 1978). A newer category of attachment proposed by Mary Main and Judith Solomon, disorganized-disoriented, is also examined (Main & Solomon, 1990).

### **Key Theoreticians: John Bowlby & Mary Ainsworth**

The most complete explanation of attachment is John Bowlby and Mary Ainsworth's ethological theory. The first important feature of this theory is the emphasis that is placed on the active role played by the infant's early social signalling system (Bowlby, 1958). Examples of signalling behaviours in infants' attachment are smiling, crying, sucking, vocalizing, and clinging. These signalling behaviours elicit the care and protection that the baby needs from their caregiver as well as promote contact between infant and caregiver (Bowlby, 1958).

The second notable aspect of ethological theory is the stress on the development of mutual attachments. There are evolutionary biases at play that make it likely that the child will use the caregiver as a secure base or as an attachment figure. This means that the caregiver is a safe zone for the infant to retreat to for comfort and reassurance when stressed or frightened while they are exploring their environment (Bowlby, 1958).

There are three conditions that must be met in order to be an attachment figure (Bowlby, 1958). The first is that they must be someone that the individual seeks in times of need or stress and that loss or separation from them causes distress. The second condition is that the person is a potential safe haven; they can provide hope or comfort

when needed. The final condition is that the individual must be a secure base, which means that they allow the person to explore and take risks without being excessively worried (Bowlby, 1958). When children are in a situation that triggers both attachment as well as escape behaviours, such as wanting to leave or avoiding facing the situation, Bowlby (1959) stated that they will experience separation anxiety if they do not have an attachment figure to go to.

Building off of this, the third key principle of ethological theory emphasizes that attachment is a dyadic relationship; it is not simply a behaviour of either the child or the caregiver (Bowlby, 1958; 1959). Bowlby (1959) argued that pseudo-affection from maternal figures could be a result of them overcompensating for (un)conscious hostility. He claimed that excessive separation anxiety is a result of negative familial experiences such as being repeatedly rejected or threatened. Moreover, he then stated that while this may be the case in particular situations, separation anxiety can be excessively low or even absent in other cases, which gives the false impression of maturity. This pseudo-independence is a defensive process (Bowlby, 1959). In contrast, an appropriately nurtured child will not actively want to be separated from their caregiver(s) but will, in time, develop self-reliance (Bowlby, 1959). These ideas helped form Ainsworth's attachment style types: ambivalent, avoidant, and secure (Bowlby, 1959; Ainsworth et al., 1978).

### ***Categories of Attachment Styles***

There are four categories of widely accepted attachment styles: (1) secure, (2) insecure - avoidant, (3) insecure anxious - ambivalent, and (4) disorganized - disoriented (Ainsworth et al., 1978; Bowlby et al., 1956).

**Secure Attachment.** The infant is confident about the caregiver's availability, responsiveness, and reliability. The caregiver simultaneously serves as a secure base of exploration and a safe haven when they are distressed. Both the exploration away from the caregiver and the type of contact after they return are important considerations (Ainsworth et al., 1978; Bowlby et al., 1956).

**Insecure-Avoidant Attachment.** The infant is not confident in their caregiver's availability, responsiveness, and reliability due to the caregiver often ignoring the distressed child. They are less likely to see their caregiver as a secure base (Ainsworth et al., 1978; Bowlby et al., 1956).

**Insecure-Anxious-Ambivalent Attachment.** This attachment style is a result of the caregiver ignoring or negatively reacting when the infant is distressed at times but responding with comfort in other scenarios. As a result, the child's behaviour is as inconsistent as their caregiver's (Ainsworth et al., 1978; Bowlby et al., 1956).

**Disorganized-Disoriented Attachment.** The infant avoids interactions with most people, including caregivers, as their parental figure neglected them. Caregiver presence or absence does not impact the infant's behaviour (Main & Solomon, 1990).

### ***Theory Conclusions***

In summary, to help understand the theoretical basis of attachment styles, looking at the main theorists who contributed to this field was vital. Two key theorists, John Bowlby and Mary Ainsworth, conceptualized the main attachment styles of secure, anxious-ambivalent and insecure-avoidant (Bowlby, 1958; 1959; Ainsworth et al., 1978). Additionally, Mary Main and Judith Solomon extended the work of Bowlby and Ainsworth by proposing a new category of attachment style known as disorganized-disoriented

(Main & Solomon, 1990). These four attachment style categories were utilized to construct our study.

These theories were relevant to our research as they provided the background information required to compare our collected data with existing information, in order to conduct a deeper analysis of the results. For example, data showed that female-identified participants had a higher likelihood of anxious and avoidant attachment style. Drawing upon the theoretical knowledge gathered, we know that this implies they are more likely to view others as unreliable, unavailable, and inconsistent (Ainsworth et al., 1978; Bowlby et al., 1956).

### **Literature Review**

The following section of the paper examines significant research regarding attachment styles and birth order from the past two decades. There are six subcategories of research, including: (a) stability of attachment over time, (b) differences in caregiver behaviour over time, (c) caregiver sensitivity, (d) social success, (e) employment, and (f) romantic relationships. Finally, there is a section dedicated to the limitations of such research, which focuses mainly on the lack of research supporting the continuity of attachment over time and the mixed results about the factors that influence attachment style development.

#### **Stability of Attachment Styles Over Time**

The stability of attachment has been observed over time. Attachment classifications at age one predicted 90% of secure attachments and 75% of insecure classifications at age six (Iwaniec & Sneddon, 2001). 72% of the children classified as secure in infancy were secure 20 years later (Iwaniec & Sneddon, 2001). These findings are highly correlated with secure attachment, and less correlated with insecure attachment styles (Iwaniec & Sneddon, 2001). However, there is evidence from both higher-risk and normative-risk samples that infant attachment on its own is only weakly associated with attachment in early adulthood. Quality of early caregiving is a relatively robust predictor of security in adulthood, as expected by attachment theory. The quality of attachment is relatively stable across time but can change if the environment improves or deteriorates. Change can go either way, but it is more common for insecure children to become secure (Hallers-Haalboom et al., 2017; Iwaniec & Sneddon, 2001).

#### **Differences in Caregiver Behaviour Over Time in Relation to Birth Order**

Lehmann et al., (2016) examined how the presence of siblings can affect the behaviour of parental figures and the treatment of the children. It has been found that parents spend less quality time with later-born children at any age and are less strict with grades. As a result, there are strong effects on cognitive ability when comparing first-born children with later-born children (Lehmann et al., 2016). This is for a few different reasons. One is that parents are unable to provide the same level of cognitive support or stimulation for later-born children in the same way that they did for their first-borns (Lehmann et al., 2016). Additionally, parents tend to revise their parenting methods as times change and new ideas and research are discovered. Finally, parents are more likely to be at ease with their younger children as they have gained more confidence in their own parenting style and experience from their first-born (Lehmann et al., 2016; Isgor, 2017). Thus, there is a negative correlation between higher birth order (e.g., second- or third-born) and IQ, educational attainment, and wages (Lehmann et al., 2016).

Furthermore, Isgor's (2017) study showed how university-aged students' secure attachment style and compassion scores are influenced by the participant's birth order and perceived parental attitudes. On average, when compared to single children and siblings, middle children had higher levels of secure attachment. Even more, middle children were also higher in compassion when compared to single children. In contrast, secure attachment styles and compassion scores were lower in participants whose parents had an authoritative parenting style (Isgor, 2017). Mediated by birth order, these cognitive differences and changes in parental behaviour can possibly affect a child's attachment style.

Finally, a longitudinal study on parental treatment, which used participants aged 12 to 14, explored the parent-child relationship through the lens of the child's perceptions of fairness and differential parental treatment. They also looked at parental empathy, and the child's psychosocial well-being, level of trust, as well as their personality (Ng et al., 2020). This study considers many different aspects that can affect attachment along with birth order, providing a well needed holistic approach to the study of attachment styles and birth order.

### **Parental Sensitivity**

Hallers-Haalboom et al., (2017) explored sensitivity in parenting styles which is defined as "appropriate adjustment to the needs and responses of children" (p. 860). Their study employed a longitudinal design in three waves in order to fully appreciate the "differences in parental sensitivity for first-born and second-born children" (p. 867) in the Netherlands (Hallers-Haalboom et al., 2017). Single parent families were excluded, and emotional availability scales (EAS) were used to measure parents' sensitivity during the children's playtime. They found that sensitivity toward the first-born decreased over time, however, sensitivity toward the second-born increased from the first to second wave and continued to remain stable until the third wave (Hallers-Haalboom et al., 2017). This may be because the older children attended school in later waves (Hallers-Haalboom et al., 2017; Kennedy et al., 2014).

However, when both children were compared at three years old, the parental sensitivity level was the same, so it is possible to infer that sensitivity plateaus eventually (Hallers-Haalboom et al., 2017). Since there is no correlation between the decreased sensitivity toward first-borns and the increased sensitivity to second-borns (when compared at the same age), Hallers-Haalboom et al., (2017) concluded that birth order likely does not influence the level of parental sensitivity, but rather the development of each child.

Aligning with these results, another study on toddler-aged sibling pairs showed that birth order is not associated with the quality of parental attachment even though mothers presented more positive emotions when interacting with later-born children and higher maternal sensitivity with older siblings (Kennedy et al., 2014). Finally, the sensitivity of both parents tend to influence each other, especially in regard to the older sibling(s) (Hallers-Haalboom et al., 2017; Kennedy et al., 2014). Despite the insignificant correlation between birth order and parental sensitivity, these studies reflect the complexity of developing parental techniques and attachment styles.

### **Social Success**

As mentioned earlier, there is a negative correlation between higher birth order and IQ, educational attainment, and wages (Lehmann et al., 2016). However, birth order and

attachment style do influence the success of all types of relationships. Abol Maali et al., (2014) found that individuals with avoidant and anxious attachment styles have “significantly negative relationships with functional social problem solving” (p. 17). As expected, these same individuals have significantly positive relationships with dysfunctional social problem solving.

Abol Maali et al., (2014) claimed that birth order significantly predicts dysfunctional social problem-solving in university-aged students. According to their research, older siblings are more likely to use dysfunctional social problem solving. On the other hand, younger siblings reported higher levels of avoidant attachment styles. They also found that children who have insecure attachment styles are more likely to have weak communication skills (Abol Maali et al., 2014). Problem-solving and communication are extremely important skills to have in order to maintain a healthy, positive relationship.

In addition, Alhusen et al., (2013) found that the avoidant attachment style is positively correlated with decreased levels of maternal-fetal attachment (MFA) throughout pregnancy. MFA can track the significance of a mother’s connection with her child while she is pregnant and how this connection will continue to develop after birth (Alhusen et al., 2013). Mothers with avoidant attachment styles are more likely to be resistant to forming bonds with their children which, in turn, causes them to have trouble bonding with not only their mother, but also other individuals in their lives. For example, if she has depressive symptoms throughout the pregnancy, then MFA levels will be lower as depression decreases mothers’ confidence in their ability to care for and nurture their child(ren). Therefore, it is not surprising to discover that anxious-ambivalent attachment styles are positively correlated with postpartum depression (Alhusen et al., 2013).

Iwaniec & Sneddon’s (2001) longitudinal study on attachment styles throughout the life course found that relationships and attachment become more healthy and secure over time for a variety of reasons. The second measurement of attachment style took place 20 years after the first measure when the participants were between ages one and eight. When support for families with a low socio-economic status is provided, it is found that their children usually display age-appropriate development and that their relationships and attachments become stronger (Iwaniec & Sneddon, 2001).

In addition, it was found that when individuals become parents, they develop a new understanding and appreciation for their own parents, helping their attachment to become more secure. Iwaniec & Sneddon (2001) also discovered that it is possible for children who had been abused to change their attachment from anxious to secure if positive changes are made to their environment. This research shows that attachment styles are not static; they can change over time, especially when helpful resources are provided for families (Iwaniec & Sneddon, 2001).

## **Employment**

A study undertaken by Leenders et al., (2019) aimed to investigate the relationship between attachment avoidance, attachment anxiety, and various factors related to job searching, including job search intention, job search self-efficacy, job search self-esteem, and job search attitude. The sample comprised 180 employees from an international industrial organization in the Netherlands (Leenders et al., 2019). This study found a strong, positive correlation ( $r = 0.38$ ,  $p = 0.01$ ) between anxious and avoidant attachment, so the researchers had to control for one style when analyzing the other (Leenders et al., 2019).

The results indicated that attachment avoidance had a greater impact on the job search process than attachment anxiety, with more avoidantly attached individuals reporting, “lower job search intentions, lower job search self-efficacy, and more negative job search attitudes” (Leenders et al., 2019, p. 487). Attachment avoidance affected job search intentions “through job search self-efficacy and job search attitude but not through job search self-esteem” (Leenders et al., 2019, p. 487). On the other hand, attachment anxiety did not have any effect on “job search intention through job search self-efficacy, job search self-esteem, and job search attitude” (Leenders et al., 2019, p. 495). Overall, attachment style was found to be an important individual characteristic that can impact the job search process.

### **Romantic Relationships**

McGuirk & Pettijohn II (2008) conducted a study in which 100 college students took an attitude towards love scale, attachment style questionnaire, and the multidimensional jealousy scale. The multidimensional scale revealed greater jealousy for middle siblings, followed by the youngest sibling group, only children, and older siblings. Notably, there was a significant gap in the levels of jealousy between the middle and older siblings. The attitudes towards love scale, on the other hand, showed that older siblings tend to be the most realistic, followed by the middle sibling, only child, and finally, the youngest sibling. These results suggest a stronger inclination for the younger siblings to be more romantic (McGuirk & Pettijohn II, 2008). The attachment style questionnaire revealed that middle siblings had the highest percentage of insecure attachment (57.14%), and only children had the highest percentage of secure attachment (66.66%) (McGuirk & Pettijohn II, 2008). The results are statistically significant; jealousy and attachment styles are related, therefore as sibling birth order plays a part in determining attachment styles, it later affects jealousy in romantic relationships which in turn affects the success of the relationship (McGuirk & Pettijohn II, 2008).

Furthermore, Robertson et al., (2014) studied birth order and its impacts on romantic relationship satisfaction and attachment style. They looked at sibling and romantic relationships among university students who had at least one sibling and were currently in a romantic relationship. Overall, younger siblings were perceived as being more favoured by parents. It was also found that younger siblings rated romantic relationships as more satisfying (Robertson et al., 2014). The older sibling group perceived themselves as having more status and power than their younger sibling while the younger siblings perceived themselves as having less power. However, the relationship between siblings did not correlate with relationship satisfaction.

Another factor that affects relationship satisfaction is the length of the relationship. For romantic relationships shorter than 24 months, there was no distinguishable difference between the satisfaction of older or younger siblings (Robertson et al., 2014). However, for romantic relationships that lasted longer than 24 months, younger siblings rated their relationships as more satisfying than the older siblings. Although statistically insignificant, the relationship with an older sibling who is perceived to have more power and authority may act as an additional parental attachment figure (Robertson et al., 2014). This may lead to a more secure attachment style for the younger sibling and thus a better relationship with their significant other (Robertson et al., 2014).

### **Limitations of Previous Research**

### ***Nature vs. Nurture***

One limitation of the existing research on attachment styles is that there are mixed findings on the continuity of attachment over time (Pasco Fearon & Roisman, 2017; Hallers-Haalboom et al., 2017). Twin studies have additionally shown that there is little genetic influence on attachment while there is a large influence from the environment. Previous findings of genetic influence are not being replicated in current data and experiments (e.g., DRD4 gene, 5-HTT gene) or have had false positives due to measurement error and extraneous variables (Pasco Fearon & Roisman, 2017). However, genetic effects should still be investigated as twin studies have failed to fully identify the genetic effects on specific styles of attachment. Furthermore, caregiver sensitivity is still a weak predictor of attachment, and more research needs to be conducted in order to learn more about environmental determinants (Pasco Fearon & Roisman, 2017).

### ***Age & Gender Demographics***

Most studies focus more on young children, so more research on adolescents or young adults is needed, as the age of the participants might affect the results. Research into the association between attachment and the socio-emotional adjustment of children is also lacking. This is an important factor that needs to be studied more, as early attachment experiences can predict how children might respond to social situations in adolescence, and even as far as adulthood (Pasco Fearon & Roisman, 2017; Hallers-Haalboom et al., 2017).

Similarly, a limitation within the study done by Robertson et al., (2014) is regarding the fact that there were 154 female participants and only 35 male participants. This does not allow for the assessment of gender differences and the role they play in the development of attachment style. Furthermore, we found no studies examining attachment among non-binary or genderqueer participants, reflecting a major gap in gender studies regarding attachment. Clearly, a more diverse participant population is needed to determine the full extent of attachment differences and the influence of various forms of sibling dynamics.

### ***Longitudinal and Cross-Sectional Studies***

A final limitation of existing research is that there are quite a few longitudinal and cross-sectional studies on attachment style in general. However, there are not many studying the relationship between birth order and attachment. Within the scope of birth order and attachment research, participant populations mainly include caregivers, young children, or adults reflecting on their adolescence. Further longitudinal or cross-sectional research is necessary to gain a better understanding of how familial relationships and attachment styles change or remain stable over time.

### ***Literature Review Conclusions***

To summarize, the current available literature demonstrates that there are some inconsistencies when it comes to the effects of birth order and attachment styles. Some studies have shown that birth order does have effects on attachment style, while others have demonstrated the opposite. The current research also highlights how birth order can impact various aspects of development, such as education, job attainment, and caregiver relationships, indicating that birth order is of some salience throughout development. Moreover, much of the research is also focused on young children or young adolescents,



leaving a gap in the research regarding older adolescents and young adults. Based on the existing literature, our objective is to address these inconsistencies by conducting research that includes older adolescents and young adults, while also providing a comprehensive understanding of the relationship between birth order and attachment style.

### **Methodology**

To restate, our research question is: how does one's birth order affect their own attachment style? The following section will explain how the research was conducted in order to answer this question.

The research was approved by the McMaster Research Ethics Board (MREB#: 0327). The method of data collection we used was an anonymous, online, quantitative survey through the McMaster Research Ethics Board (MREB) approved platform LimeSurvey. The survey consisted of 18 questions, nine of which were on a seven-point Likert scale ranging from strongly disagree to strongly agree and included a "prefer not to answer" option. The next four questions were multiple choice or written answers pertaining to number of siblings, position of birth order amongst siblings, as well as birth years of siblings. Finally, the last five questions involved general demographic information pertaining to the participant's year of undergraduate study, gender, age, and race/ethnicity, which were inspired by McMaster University's (n.d. a) guide to demographics. Some of the questions involved in the survey may have been sensitive and participants were not required to answer every question if they did not feel comfortable doing so. Examples of questions participants were asked include rating on a scale of one to seven the extent to which the following statements apply to them: "I am uncomfortable opening up to people, I fear that other people will reject me, I frequently worry people do not genuinely care about me."

### **Researchers**

The collection, analysis, and write-up of the results was conducted by six fourth-year students in the Social Psychology program as part of their thesis requirement. The research project was supervised by Dr. Sarah Clancy, professor of the SOCPSY 4ZZ6 A/B course.

### **Research Process**

The research process first entailed gathering existing data on the topic of attachment styles which included the definition of attachment and its different styles. We also collected existing data on birth order and its effect on attachment style to further our knowledge of the research topic. Our group then crafted a survey to specifically determine the participants' attachment style, birth order, and demographics such as year of study, age, gender, and ethnicity.

In order to determine attachment style, we took inspiration from the freely available Experiences in Close Relationships Scale - Relationship Structures (ECR-RS) questionnaire (Fraley et al., 2011). As opposed to focusing on a specific type of close relationship (such as mother-child, father-child, friendship, or romantic), we chose to use the adapted ECR-RS aimed at global attachment to determine one's attachment style for close relationships in general. The survey involved six questions aimed at scoring attachment-related avoidance and three questions aimed at scoring attachment-related

anxiety. Therefore, participants could score high in both avoidance and anxiety. If they scored low in both avoidant and anxious attachment, then it was assumed that they had a secure attachment style.

### **Recruitment**

After we received ethics approval, we started student recruitment on November 11, 2022, and concluded on February 17, 2023. The sampling methods used were snowball and convenience sampling. The link to the letter of information and the survey were distributed through email and social media amongst the general McMaster undergraduate student body, as well as specific clubs, for anonymous completion. All of the participants were McMaster undergraduate students who are 18 years of age or older.

### **Data Analysis**

After inputting all the results from the responses to our survey into an Excel spreadsheet, the data was uploaded into Jamovi. Using version 2.2 of the Jamovi software to conduct our statistical analysis, we calculated descriptive statistics (mean and standard deviation), frequency analysis, correlation matrix, linear regression, and the reliability of our measures using Cronbach's alpha. Moreover, the level for statistical significance was set at  $p \leq 0.05$  when analyzing our data.

### **Data Privacy**

During the research collecting and analyzing process, only members of the research team had access to the data. As an additional measure of security, the data was stored on password-protected computers and, where possible, password-protected files.

### **Ethical Issues: Survey Completion**

#### **Researcher Conflicts of Interest**

There were minimal ethical concerns regarding researcher conflict of interest, as the researchers did not receive personal compensation for the research. Furthermore, the only link between the researchers and the participants was that they are all undergraduate students at McMaster University. Lastly, third party recruitment methods were used so there was no direct contact between the researchers and participants.

#### **Social & Psychological Risks**

There may have been potential social and psychological risks from participating in this research study. In terms of social consequences, participants may not have remained anonymous, depending on the location they filled out the survey and/or if they liked or forwarded social media posts in relation to our research. To combat this, participants were encouraged to complete the survey in their own time and space so they could be alone. The following statement was included in the recruitment script, "please do not like or forward this post if you wish to remain anonymous."

In terms of psychological risks, participants may have felt worried, embarrassed, or uncomfortable during or after participating in the survey. To mitigate these potential consequences, students could have skipped any questions they did not wish to answer (except for the consent question) and could close the survey at any point before submission. Participants did not face any consequences for failing to complete any or all the survey questions. In addition, the survey was anonymous, so any potentially

identifying information cannot be traced back to them. Finally, the survey included below minimal risk questions. Nonetheless, prior to and after taking the survey, wellness resources were made available to the participants as a precautionary measure, acknowledging that everyone's experiences may differ. Overall, the research posed no greater risk to participants than those faced in daily life.

### **Summary of Methodology**

As previously mentioned, the research was conducted by six undergraduate students at McMaster University. The sampling methods used for this study were snowball and convenience sampling. The survey was anonymous and distributed digitally to the McMaster student body and various McMaster Student Union (MSU) clubs through email and social media platforms. Participants had from November 10th, 2022, to February 17th, 2023, to respond.

In total, the research process included gathering existing information on the topic of attachment styles, birth order, and their potential relationship. We then created a survey on the MREB approved platform, LimeSurvey, with questions that pertained to our chosen topic of attachment style and birth order. To determine attachment style, we utilized the Experiences in Close Relationships Scale - Relationship Structures (ECR-RS) questionnaire on global attachment as a starting point for the construction of our survey (Fraley et al., 2011). As for data privacy, only the research team had access to the survey responses, and it was password-protected to ensure the privacy of participants. Finally, the data was analyzed using version 2.2 of the Jamovi statistical software program.

Overall, there are minimal ethical concerns with this study. The only link between the researchers and participants is that they are all undergraduate students at McMaster University. While the survey was entirely anonymous, participants were also encouraged to complete the study alone in order to ensure that their identities were kept private. Additionally, participants could skip any questions they did not wish to answer, aside from the consent question, and were given wellness resources at multiple points throughout the survey.

## **Results**

### **Population Demographics**

The respondents to our survey included 100 McMaster undergraduate students between the ages of 18 to 22 years old, with 43% of participants being 21 years old. The majority of respondents identified as female (76%), with 17% identifying as male and 6% identifying as non-binary. Six faculties were repeated across all 100 respondents: Social Science (29%), Science (29%), Engineering (18%), Health Science (10%), Business (7%), and Humanities (5%). There was also some variability among the ethnic make-up of respondents. Answers for the self-identified ethnicities of respondents were sorted into the following broad categories: 49% White, 22% South Asian, 11% multiethnic, 9% East Asian, 3% South-East Asian, 2% Middle Eastern, 1% Eastern European, 1% Hispanic/Latino, and 1% African. For our purposes, the multiethnic category included any response that indicated two or more of the previous broader ethnic categories.

### **Attachment Style Statistics**

Avoidant attachment was assessed in questions one through six, with questions one to four reverse scored. The mean score (out of seven) for attachment-related avoidance

among our 100 participants was 3.57, with a standard deviation of 1.16, a minimum of 1.50, and a maximum of 6.00. Anxious attachment was assessed among respondents by averaging the scores of their responses for questions seven through nine. The mean score (out of seven) for attachment-related anxiety among our 100 participants was 4.85, with a standard deviation of 1.72, a minimum of 1.00, and a maximum of 7.00. Using Cronbach's alpha, the reliability analysis revealed that our attachment questionnaire had good internal consistency ( $\alpha = 0.795$ ). Please see Table 1 below for a summary of these results.

**Table 1**

*Average Attachment-Related Avoidance & Anxiety Descriptives*

	Average Avoidance	Average Anxiety
N	100	100
Missing	0	0
Mean	3.57	4.85
Median	3.67	5.33
Standard Deviation	1.16	1.72
Minimum	1.50	1.00
Maximum	6.00	7.00

**Birth Order**

The correlation between average avoidance, average anxiety, and birth order was also determined. Through a correlation matrix (Table 2), it was found that there is a very weak negative correlation between birth order and attachment-related avoidance ( $r = -0.094$ ), but it was insignificant ( $p = 0.351$ ). It was also determined that there is a weak negative correlation between birth order and attachment-related anxiety ( $r = -0.015$ ) but, again, it was insignificant ( $p = 0.883$ ). Surprisingly, there was a weak positive correlation between anxious and avoidant attachments ( $r = 0.224$ ) with significant results ( $p = 0.025$ ).

The data depicts little to no correlation between birth order and avoidant or anxious attachment, with the  $p$ -values suggesting insignificant results. There is a weak, positive correlation ( $0.224$ ,  $p = 0.025$ ) between anxious and avoidant attachment, suggesting that those with dimensions of an anxious attachment are more likely to also have dimensions of an avoidant attachment, and vice versa. This correlation is significant.

**Gender Differences**

Through linear regressions, it was also illustrated that there is a gender difference. For the correlation between birth order and attachment-related avoidance, it was found that

**Table 2**

*Correlation Matrix Between Attachment-Related Avoidance, Average Anxiety, and Birth Order*

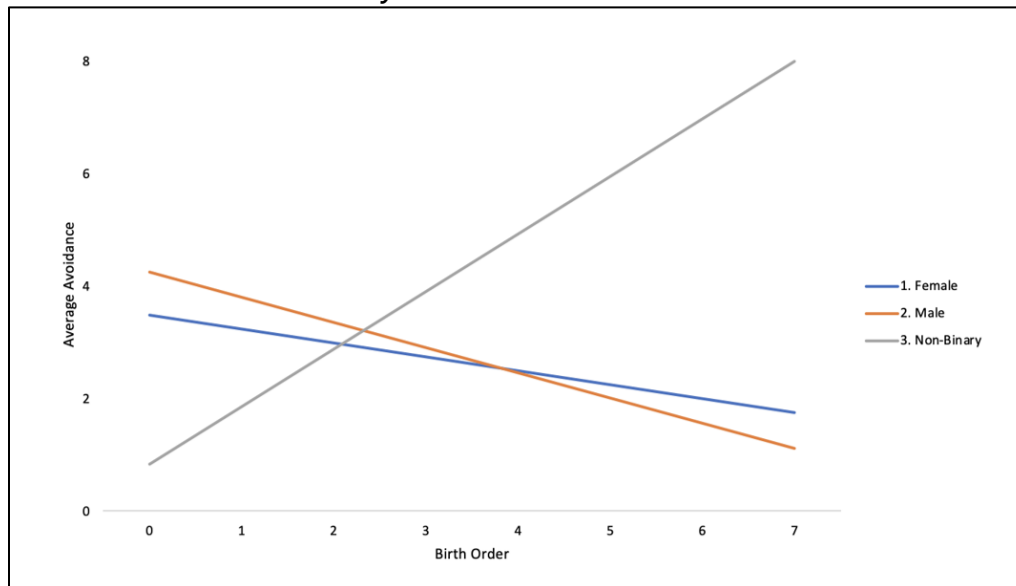
		Average Avoidance	Average Anxiety	Birth Order
Average Avoidance	Pearson's r	–		
	<i>p</i> -value	–		
Average Anxiety	Pearson's r	0.224*	–	
	<i>p</i> -value	0.025	–	
Birth Order	Pearson's r	-0.094	-0.015	–
	<i>p</i> -value	0.351	0.883	–

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

both males and females had a negative correlation, while non-binary participants showed a positive correlation. Although, the correlation between the variables is very weak ( $r = 0.293$ ). See Figure 1 below for the graphical display of this finding. The  $p$ -value for the correlation between attachment-related avoidance and birth order, as mediated by gender, was  $p = 0.886$ , and therefore, was insignificant.

**Figure 1**

*Birth Order x Avoidance: by Gender*

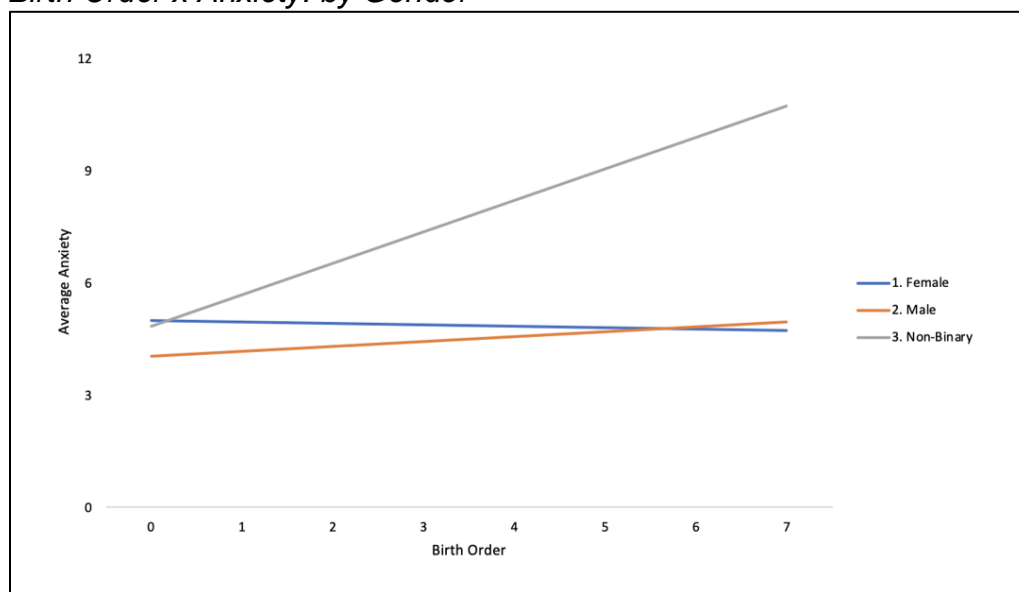


The linear regression illustrates the relationship between the average means of attachment-related avoidance and birth order, separated by gender variables. Male and female identifying participants had a negative correlation with attachment-related avoidance, meaning younger siblings scored lower on avoidant attachment than older

siblings. Non-binary identifying participants had the opposite trend, meaning younger siblings scored higher on avoidant attachment than older siblings.

For the correlation between birth order and attachment-related anxiety, it was found that only females showed a negative correlation while both male and non-binary participants showed a positive correlation. Although, the correlation between these variables is very weak ( $r = 0.262$ ). See Figure 2 below for the graphical display of this finding. The  $p$ -value for the correlation between attachment-related anxiety and birth order, as mediated by gender, was  $p = 0.835$ , and therefore, was also insignificant.

**Figure 2**  
*Birth Order x Anxiety: by Gender*

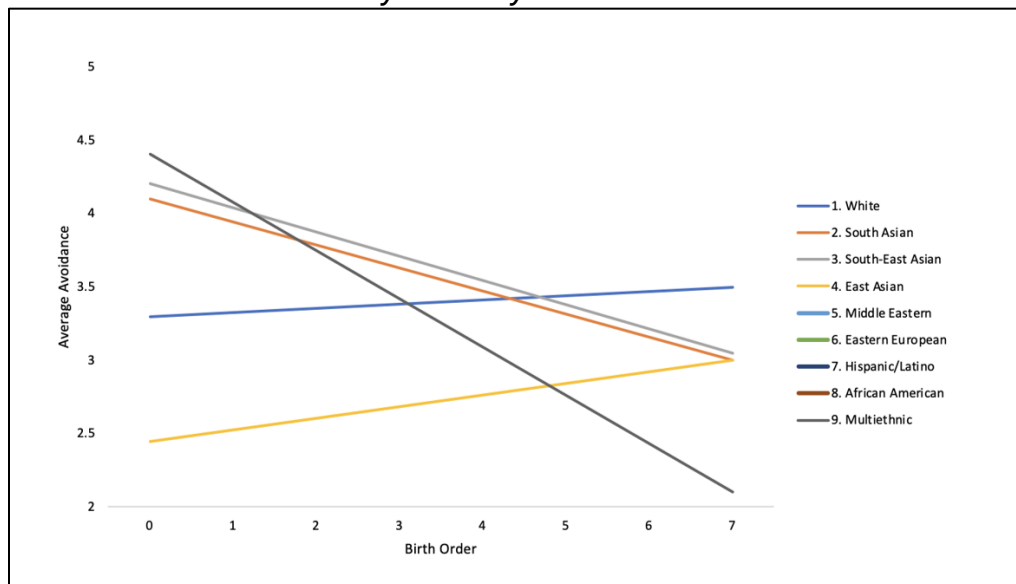


The linear regression illustrates the relationship between the average, centred means of attachment-related anxiety and birth order, separated by gender variables. Male and non-binary identifying participants displayed a positive correlation with anxious attachment, meaning younger siblings scored higher on attachment-related anxiety than older siblings. However, non-binary participants displayed a much stronger positive correlation between attachment-related anxiety and birth order than their male counterparts. Female identifying participants displayed a negative correlation, meaning that younger siblings scored lower on attachment-related anxiety than older siblings.

### ***Ethnicity Differences***

Through linear regressions, it was illustrated that there are some differences based on ethnicity. See Figure 3 below for the graphical display of this finding. The correlation coefficient for these variables was  $r = 0.402$ , making the correlation weak. Multi-ethnic participants depicted the strongest negative correlation between an avoidant attachment style and birth order, while those who identified as White or South-East Asian represented a positive correlation between avoidant attachment style and birth order. The  $p$ -value for these results is  $p < 0.001$ , and therefore were significant.

**Figure 3**  
*Birth Order x Avoidance: by Ethnicity*

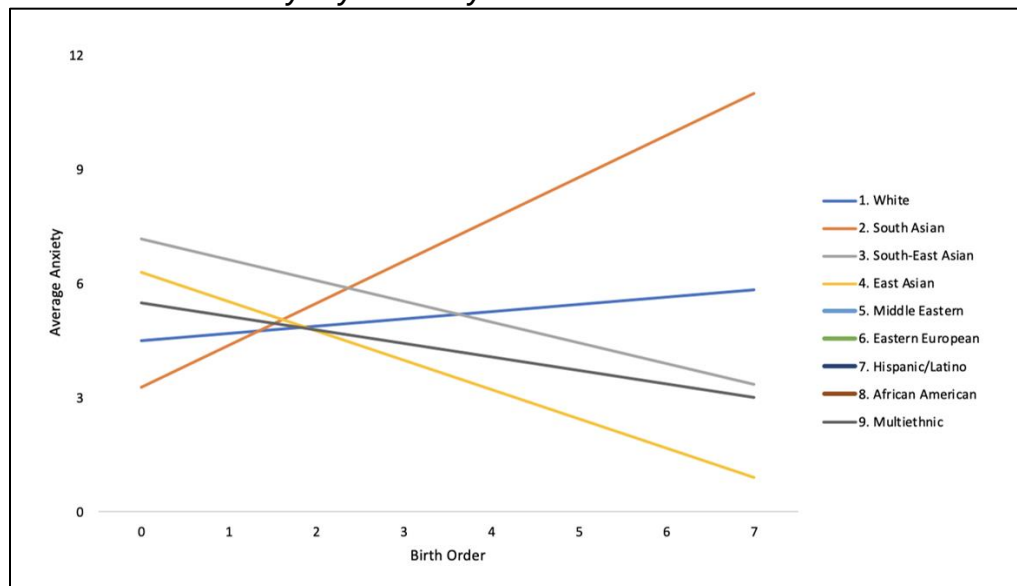


The linear regression portrays the correlation between the average means of avoidance, for each variable of ethnicity, and birth order. White and East Asian participants reported a positive correlation between avoidance and birth order meaning younger siblings scored higher on the scale of avoidance in comparison to older siblings who scored lower. South Asian, South-East Asian, and multiethnic participants reported a negative correlation between the average means of avoidance and birth order meaning older siblings scored higher on the scale of avoidance while younger siblings score lower. Figure 3 only includes five out of nine ethnic variables because the Middle Eastern, Eastern European, Hispanic/Latino, and African American variables have only one participant each, not making their results representative of the population.

As per the correlation between attachment-related anxiety and birth order pertaining to ethnicity, it was found that there was a weak positive correlation ( $r = 0.410$ ). See Figure 4 below for the graphical display of this finding. Nonetheless, participants who identified as either White or South Asian, on average, portrayed a positive correlation between attachment-related anxiety and their birth order, while South-East Asians, East Asians, and multi-ethnic participants depicted a negative correlation. These results were significant ( $p < 0.001$ ).

The linear regression illustrates the correlation between the means of anxiety, per ethnic groups, in relation to birth order. White and South Asian participants depicted a positive correlation meaning younger siblings scored higher on the scale of anxious attachment while older siblings score lower. South-East Asian, East Asian, and multiethnic participants portrayed a negative correlation meaning younger siblings scored lower on the scale of anxious attachment while older siblings scored higher. Only five out of nine ethnicity variables are shown in Figure 4 because Middle Eastern, Eastern European, Hispanic/Latino, and African American categories only included one participant each, not making their results representative of the population.

**Figure 4**  
*Birth Order x Anxiety: by Ethnicity*



## Discussion

In summary of our results, we came across four main findings. The first finding is that there were no significant correlations between anxious attachment and birth order or between avoidant attachment and birth order. In conjunction, the second finding is that there were gender differences found for these correlations, albeit insignificant. Next, there were both significant and insignificant differences regarding participants' ethnicity. The final finding is that there was a weak, positive correlation between avoidant and anxious attachment, which was statistically significant. These findings are outlined and explained in connection to the current literature in the following sections.

### Birth Order & Attachment

Firstly, we found no significant correlations between birth order and attachment style. In other words, whether an individual was first-born, second-born, etc., had little to no effect on their general attachment style. Our results contrast with previous findings from Isgor (2017), as their research articulated that middle-born children showed higher levels of secure attachment than their older or younger siblings, but our research showed no significant data to support this notion. The results of our research do align with findings from Kennedy et al., (2014), as they similarly discovered that birth order is not associated with the attachment style a child shares with their parent(s).

### Gender Differences

Next, we found that there were some gender differences when it came to attachment styles. Individuals who identified as non-binary and were higher in birth order were more likely to adopt both an anxious and avoidant attachment style, which suggests that non-binary individuals who were amongst the younger of their siblings may view others as unreliable and unavailable according to theory of attachment (Ainsworth et al., 1978; Bowlby et al., 1956). Those who identified as male were more likely to have an anxious attachment style if they were a younger sibling, while those who were an older sibling



were more likely to adopt an avoidant attachment style. This correlation alludes to the fact that men have the potential to view their relationships with others as unreliable and unavailable while also viewing others as inconsistent (Ainsworth et al., 1978; Bowlby et al., 1956). Lastly, female-identified participants were more likely to have an anxious and avoidant attachment style if they were an older sibling, meaning that they may view others as unreliable, unavailable, and inconsistent (Ainsworth et al., 1978; Bowlby et al., 1956).

### **Ethnic Differences**

In addition, there were various findings regarding the correlation between ethnic identities, birth order, and attachment style. In regard to the avoidant attachment style, multi-ethnic participants who were amongst the oldest of their siblings were more likely to adopt this attachment style, which was insignificant. To contrast, White or Southeast Asian participants who were the younger of their siblings were likely to have an avoidant attachment, which was significant. Additional significant findings suggested that younger siblings who identified as White or South Asian and older siblings who identified as South-East Asian, East Asian or multi-ethnic were more likely to adopt an anxious attachment style.

### **Avoidance & Anxiety**

Finally, our research revealed a minor yet statistically significant positive correlation between anxious and avoidant attachment. This aligns with the findings of Leenders et al., (2019) regarding the impact of attachment styles during job search. They reported a strong and significant correlation ( $r = 0.38$ ,  $p < 0.01$ ) between anxious and avoidant attachment (Leenders et al., 2019). Future studies involving larger sample sizes could benefit from controlling one variable when analyzing the other to minimize any potential confounding effects.

### **How Do These Results Contribute to Current Research?**

One of the purposes for our research was to provide more information regarding attachment theory and we believe that our results show that there needs to be more research and experimenting done to determine if birth order does or does not have an influence on attachment styles. Our findings contribute support for the recent research that exhibits how attachment style and birth order are unrelated but continues to contradict other recent research that does display a correlation between the two variables. It is indicative of the implication that attachment can be the product of more than just birth order and the genetic or environmental factors that come with it. Thus, it is salient that more research should be conducted, and suggestions for future studies are outlined in the following sections.

### **Summary & Conclusions**

To summarize, our research project was inspired by the prevalence of attachment theory in the field of social psychology which led us to develop our topic of researching the potential correlation between birth order and attachment style. The current available research is limited regarding the populations that have been studied and the lack of consistency and information regarding the effects of birth order on attachment style. The results of our research generally support the research negating the relationship between these variables, as well as the difference between the gender and ethnic demographics.

However, more research is needed to make definitive correlations or potentially even causal conclusions. The following sections will outline the limitations of our study as well as suggest areas for future research.

### **Limitations of Present Study**

#### ***Participant Bias***

While much precaution was taken to ensure the least number of limitations, there were certain variables and factors that could not fully be controlled. A limitation that exists within our study is the influence of personal bias regarding survey answers. There is a possibility that while answering questions relating to attachment style, students may respond according to how they perceive themselves to think and behave in certain scenarios, or based on what they think researchers are expecting of them. In reality, their behavioural and cognitive response may be different, thus, hindering the study's accuracy. For example, if a student responds to question 1 prompt (c), "I discuss my thoughts and feelings with others," with "(1) strongly agree," but in reality, they are unconsciously sharing or suppressing selective thoughts and feelings, this is the type of personal bias that alters the reliability and accuracy of the research results.

#### ***Attachment Survey Questions***

Another main limitation of this study is that although there are four prominent styles of attachment, we only collected survey data for two styles, excluding secure and disorganized-disoriented attachment. While we can assume that those low in both avoidance and anxiety are generally more secure, we cannot make any correlation conclusions without quantitative data. Due to time and population restrictions, we chose to include two styles in our survey to ensure the survey was short and concise, while still collecting comprehensive data about attachment.

#### ***Sample Demographics***

A third limitation of the study would be our limited sample size of 100 McMaster undergraduate students, which was due to time restrictions and external affairs. It is worth noting that due to the limited size and diversity of the sample, the results may not be generalizable or representative of a larger population. To illustrate, it is unlikely that the 6 participants (out of 100) who identified as non-binary are representative of the larger non-binary student population at McMaster. Similarly, it is unlikely that our overall conclusions can represent the general McMaster population when 76% of the participants identified as female.

#### ***Interpreting the Data***

The nature of the research and participants involved posed some challenges with interpreting and generalizing the data. Since the research was not experimental, there was no random assignment of participants. Therefore, there is no guarantee of the representation of McMaster's undergraduate population, and we cannot infer any causal relationships. Additionally, the research is quantitative and not cross-sectional or longitudinal, making it difficult to obtain a deeper understanding of participants' family dynamics and style of attachment over time.

#### ***Western Perspective***

A final limitation of the current study is that it takes a primarily Western perspective, from the theoretical foundations and literature review to the analyses of our survey data. Attachment theory is rooted in the work of British and North American researchers, and the articles examined were all conducted from the same cultural perspective. Our survey was created based on this research and although we did analyze differences based on ethnicity, no major conclusions or interpretations can be made without further analysis of attachment in different cultures. A literature review of any research indicating cultural differences in attachment and sibling studies is needed, not just within North America, but within Eastern countries as well.

## **Significant Insights & Future Research**

### ***Parenting Style & Birth Order***

After thoroughly researching and analyzing attachment and birth order, it can be concluded that there is still a lot that is unknown. Many studies have consistently shown that there is some sort of correlation between attachment styles with parenting and that parenting styles are prone to change throughout the course of parenthood. However, these studies fail to explain if there is a direct correlation between birth order and attachment.

Furthermore, research is needed to gain insight into why there are outliers. While parenting styles will inevitably change, there are cases where subjectively “perfect” parenting leads to negative attachment styles, regardless of an individual’s birth order or vice versa. Therefore, it is important to gain an understanding regarding how much effect parenting styles really have on attachment styles and how much of it is just the influence of other genetic, social, and environmental influences.

Future studies can conduct more quantitative research in conjunction with qualitative research to better understand and interpret the quantitative results. More specifically, researchers can inquire about the differences or similarities in a caregiver’s parenting style and the home environment the participants come from. Furthermore, experiments can also be conducted in a controlled environment to determine any potential causal relationships. Then, we can begin to understand the relationship between these variables and identify ways to ensure consistent parenting among siblings, if necessary.

### ***Twin Studies***

There is limited research supporting the influence of genetic composition on attachment styles, with the majority of literature highlighting external environmental factors. Research by Pasco Fearon & Roisman (2017) highlights the potential influence of certain genes to influence attachment in twin studies, however, these results are generally not being replicated in current studies. Our study included only two individuals who had a twin sibling, so we did not calculate any correlations specifically for twins. Overall, more research is needed to determine the potential genetic influence on attachment by studying both monozygotic and dizygotic twins (or triplets, quadruplets, etc.) and comparing them with non-twin sibling research.

### ***Gender Differences***

The results of this research indicate some gender differences, although they were not statistically significant. Research specifically analyzing the difference in attachment based on gender identification is necessary, as it may point to greater structural

influences on attachment style, or variables that may influence the relationship between attachment and birth order. For example, it seems plausible that men would be higher in attachment avoidance because they are not expected to show emotional vulnerability, which is a key trait of avoidant individuals (Miller, 2022). Our results displayed a trend for males to be more anxiously attached if they have a higher birth order and more avoidantly attached if they have a lower birth order, but this is likely due to the limited sample size and demographics. In addition, it would be significant for more research to include non-binary participants, as previous research only collected results from male and female participants. Our results suggested that non-binary individuals are more likely to have an anxious and avoidant attachment style, which could be due to the limited sample, but also extraneous variables influencing them as a marginalized group. Overall, more research is needed to reduce the gap in research regarding such gender differences.

### ***Adolescent Research***

There is limited research with adolescent participants, particularly older adolescents. Many studies include adult participants reflecting on their childhood experiences, which may not provide an accurate depiction of their experiences or attachment in childhood, nor how their attachment has changed since then. Cross-sectional and longitudinal studies are needed to determine how attachment is influenced in childhood by birth order and how it develops over time, especially within different demographics.

### **Concluding Thoughts**

Overall, this research supports the finding that attachment is not significantly related to birth order, however, more research is needed to lessen the disparities in research findings on this topic. Our analysis of literature from the 21st century and our current data illustrate the need for further research in the following areas: (a) the influence of parenting styles on children, (b) twin studies to determine a potential biological influence on attachment, (c) gender differences among attachment development, and (d) more research generally involving adolescents, especially in cross-sectional or longitudinal research. These research topics will guide us toward a better understanding of attachment and its relationship to birth order and family dynamics.

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