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Birth Order as a Predictor of Anxiety

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Abstract

This study examined the relationship between birth order and anxiety regarding the transition from high school to becoming a university student. Participants were categorized based on their biological birth order, psychological birth order, and living location. Participants' state anxiety, trait anxiety, and self-esteem were measured and analyzed for predictable patterns in birth order and anxiety level. No statistically significant results were observed but results trended towards middle children scoring lowest on anxiety and self-esteem, youngest children scoring highest on anxiety and self-esteem, and firstborn and only children scoring similarly on anxiety but only children having slightly lower self-esteem. Results were consistent with past research which explains this phenomenon by the type of perfectionism fostered by being in a particular birth order.

The effect birth order has on personality has long been debated in psychology. The issue of whether birth order has a lasting impact on personality was first analyzed by Alfred Adler who laid the foundation for later researchers, who branched out to investigate birth orders' effect on personality from an evolutionary perspective. Results from these studies (Abdel-Khalek, 2002; Adler, 1929; Carballo, García-Nieto, Álvarez-García, Caro-Cañizares, López-Castromán, Muñoz-Lorenzo, & Baca-García, 2013; Damian & Roberts, 2015; Eckstein, 2000; Moore Agger, 1997) sparked research examining if these fostered personality traits had a predictable impact on mental health. The results of birth order studies (Abdel-Khalek, 2002; Adler, 1929; Carballo et al., 2013; Damian & Roberts, 2015; Eckstein, 2000; Gnilka & Noble, 2012; Moore Agger, 1997) were examined to hypothesize that that birth order could be used as a predictor for anxiety levels.

Adler theorized that the order in which individuals are born into a family fosters specific personality characteristics. This birth position was believed to influence a person's perceptions and interactions with their environment in a predictable way, promoting typical personality traits (Adler, 1929). Adler identified four distinct birth order positions: oldest, middle, youngest, and only children; each with a specific set of personality characteristics (Adler, 1929). Adler's birth order theory has since been validated, with significant results (e.g., Carballo et al., 2013; Rohrer, Egloff, & Schmukle, 2015) and through a large empirically conducted meta-analysis by Eckstein (2000). This theory has been useful in better understanding individuals in a clinical environment.

Adler describes the first born as being in a unique position because they also experience being an only child for a short period of time. The oldest child feels what Adler (1929) called *dethronement* when the next child is born because they no longer have the parents' undivided attention. The birth of a second child in the family produces both a sense of competition for the firstborn and a sense of needing to teach the newborn and be a strong role model for them. This

awareness of responsibility encourages development of character that is rule oriented, perfectionistic and possessing a strong desire to please adults. This responsibility also leads to firstborns exercising power and authority over others, giving them keen organizational skills, which strengthens their ability to enforce the rules. Alternatively, the negative outcome that could occur in a first born is a pessimistic child who desires to dominate others and "acts out" in hopes that things will return to the way they were before the second child was born. Both Adler (1929) and Ekstein (2000) found that the most frequent characteristics associated with the oldest children were successful achievement of goals, intelligence, academic success and motivation.

In Adlerian theory, the second born and all middle children could be categorized together. Middle children are different from the oldest because from the moment they are born they are sharing the attention of their parents, and later experience the addition of other children entering the family. Adler saw middle children as peacemakers, tending to be more relaxed in their interactions and non-perfectionistic (Adler, 1929). Middle children were always comparing themselves to the oldest, resulting in achievement beyond their peers. They also had a low tolerance for strict leadership due to their constant competition and commands from their older sibling. As oldest children tend to be very competitive, Adler saw middle children as taking advantage of this to become the peacemaker of the family and to expose injustice when needed. From dealing with the older sibling, Adler contended, middle children develop more diplomatic and effective negotiating skills which lead to stronger relationships with other than their firstborn counterpart. While Adler didn't specify predictable outcomes for middle children, Carballo et al., (2015) found that being a middle child may act as a protective factor against the development of certain psychiatric disorders such as attention deficit hyperactivity disorder and emotional disorders.

Regarding the youngest child, Adler viewed the last-born child as always competing with their older siblings and as a result, setting very high standards and expectations for both themselves and others around them (Adler, 1929). These goals, however, are unattainably high, leading to unachieved goals and in turn, ambivalence toward life. It was proposed that the youngest sibling typically always has someone there to take care of them, they do not fully develop independence, and develop an attitude of entitlement. While this picture seems bleak, Adler also associated characteristics such as charm, light heartedness and playfulness with the youngest.

Adler described only children as being in a unique position where they have no competition with siblings, receiving all the attention and resources of the parents (Adler, 1929). This situation promotes self-confidence, but they may have difficulty accepting adulthood responsibilities, preferring the pampering they became accustomed to as a child. Although this point is debated, loneliness could be an obstacle for only children even when in the presence of their parents. Their parents are often seen as rivals by these children, in place of siblings. Adler thought that only children dealt with this situation through setting high goals and standards, and would go about achieving those goals in an independent and perfectionistic manner. It was also argued that children who are several years apart may have characteristics of an only child; touching on the concept of psychological birth order which will be discussed in detail later (Adler, 1929; Stewart & Campbell, 1998).

Evolutionary psychology has also examined the effects of the birth order on personality and uses similar explanations to Adler, but categorizes differences in birth order personality in terms of The Big 5 personality traits: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (Sulloway, 1996). Researchers from this perspective

go on to explain birth order personality differences in terms of the different niches acquired by children to maximize parental attention (Moore Agger, 1997; Sullaway, 1996, 2007).

Evolutionary psychologists viewed the first-born child as being the most favored out of all the children, receiving the most resources and attention, as demonstrated by their frequent advancement in both physical size and mental abilities (Sulloway, 2007). Sulloway hypothesized that first-borns would be dominant, assertive and score highly on Conscientiousness, and Neuroticism (Sulloway, 1996). Other researchers went on to add more detailed information of typical scores of first-borns on The Big 5. It was contended that first-borns are highly responsible, are often a dominating role-model, parent pleasers and score highly on the intellectual aspects of Openness and the dominance aspect of Extraversion (Rohreret al., 2015). Middle born children were thought to have the least amount of parental attention. Rohreret al., (2015), aligning with Adler, felt that middle children were likely to be peacemakers of the family and compromise a lot due to lack of positional power (they do not have the advantages of being the first or last child). Middle-borns scored highly on unconventional aspects of Openness, Agreeableness, and the sociability aspect of Extraversion (Rohrer et al., 2015). The youngest child, however, was viewed as obtaining a lot of protection from the family. This is particularly true for the mother, as this is the last child that she will carry so is more symbolic of finality (Sulloway, 2007). Sulloway noticed that the youngest child tends to demonstrate high levels of sociability and openness to experiences (Sulloway, 2007). Birth order has not only been linked to personality but also more controversially, intelligence, as the ratio of adults to children in the household changes.

Sir Francis Galton (1874) was the first to note that there was an overrepresentation of firstborn sons among scientists. He attributed this to parents giving more resources to firstborn

sons and additionally, to the family environment fostering firstborns taking on more responsibility than their other siblings, and therefore, increasing intellectual stimulation and development. Today, this is called the confluence model. The confluence model proposes that the ordinal position in which children are born determines their level of intellectual stimulation influencing their IQ. It has been proposed that the oldest child receives the most stimulation while the youngest child has the most diluted overall intellectual environment (Damian & Roberts 2015; Rohrer et al., 2015). This theory contends that the higher the ratio of adults to children, the richer the overall intellectual stimulation and thus, intelligence. The oldest has both the advantage of solely adult language when learning to speak plus the ability to teach language and other concepts to younger siblings, only solidifying the oldest child's own knowledge. In a large Norwegian population, significant results were demonstrated in both a within *and* between family design controlling for socioeconomic status and family size. This study's later-born population were consistently found to have lower IQ's (Kristensen & Bjerkedal, 2007). A representative sample of American students were also examined and the same results were found, with a small effect size. This finding regarding IQ was explained as firstborns having an intellectual advantage because they have more consistent verbal stimulation from both parents (Damian & Roberts 2015). In line with these results, another study conducted by Rohrer, Egloff, and Schmukle (2015) revealed that a randomly picked firstborn had a 52% chance of having a higher IQ than a randomly picked second-born, and that in six out of ten cases, the older sibling had a higher IQ than the second-born. Larger effect sizes were found when within-family studies were conducted, as more variables were controlled for. These results are consistent with the confluence model and the evolutionary perspective of the effects of birth order.

When clinical populations have been observed, consistencies between specific psychiatric

problems and birth order were found (Carballo et al., 2013; Eckstein, 2000; et al., 2012). It has

been argued that the personality traits that birth order fosters may predispose children to certain

mental health problems. As described earlier, first-borns tend to be high achieving, what Gnilka

et al. (2012) call adaptive perfectionists. Adaptive perfectionism is often viewed as the way that

people deal with standards and expectations. An adaptive perfectionist (often first-borns) would

set high, but reasonable goals and likely achieve those goals by doing their best. Adaptive

perfectionism is productive and has been linked to higher self-esteem, decreased levels of

depression and anxiety, lower levels of feelings of inferiority, higher conscientiousness and

lastly, increased levels of hope (Gnilka et al., 2012). These findings are consistent with Adler's

(1929) birth order theory which maintains that first born children are perfectionistic, set high

goals, and are typically successful at achieving their goals. Being an adaptive perfectionist is

therefore an advantage or protective factor against mental health problems. This adaptive

perfectionism is an advantage for firstborns, protecting them from mental health issues (Gnilka et

al., 2012).

Middle children also seem to be protected regarding their mental health. When looking at

a clinical population, Carbello et al., (2013) found that being a middle child is a protective factor

against emotional disorders (Carballo et al., 2013). Middle children also tend to be non-

perfectionistic, protecting them from dissatisfaction in their life (Rohrer et al., 2015).

Youngest and only children seem to have the most psychiatric problems likely because

they were found to be maladaptive perfectionists (Carballo et al., 2013; Gnilka et al., 2012; Rice

& Van Arsdale, 2010). Maladaptive perfectionists, in contrast to adaptive perfectionists, feel as

though they are unable to achieve their goals as they planned, which leads to feelings of

disappointment, low self-esteem, depression, anger with themselves for their *perceived* failures,

and increased stress levels (Gnilka et al., 2012; Rice & Van Arsdale, 2010). While only children are often maladaptive perfectionists, it seems that youngest children are the most affected in their mental health. Carballo et al., (2013), found that there was a higher percentage of last-born children who had common emotional disorders (Carballo et al., 2013); they had more alcohol abuse and psychiatric problems than other birth orders likely due to their poorer adaptive behavior (Eckstein, 2000).

The current study examined *psychological* birth order in addition to chronological birth order. Psychological birth order takes into account the child's perceived birth order in the family. This perceived birth order may differ from their chronological birth order due to varying family structures or dynamics (Stewart & Campbell, 2001). A common example used to explain this concept is that if there is a large age gap between siblings, typically defined as 5 or more years, then both children may act as if they were only children. Psychological birth order acknowledges environmental influences as a crucial factor in studying the effects of birth order on personality. White and Campbell (1993) developed an instrument for measuring individuals' psychological birth order which is in accordance with Adler's theories (1928). It is an inventory composed of 46 yes or no statements regarding individuals' feeling and attitudes towards their family, which is scored to decipher which psychological birth order position is perceived resulting from family influences.

The present study investigated whether people with a specific birth order position would display more anxiety than others. The effects of birth order on anxiety for first year undergraduate students, specifically regarding their transition from home life to university life were examined. It was anticipated that last born children would have the highest level of anxiety because of their maladaptive perfectionism (Adler, 1928; Gnilka et al., 2012), possible lower

intellectual stimulation making them feel more overwhelmed with the academic difficulty of

university (Rohrer et al., 2015), and due to their high rate of psychiatric problems in general

(Abdel-Khalek, 2002; Carballo et al., 2013).

Methods

Participants

Thirty-two (n=32) first year, female psychology students from Brescia University

College were recruited to participate in the present study. The average age of participants was 18

and they were still transitioning from living at home to living on the university campus or away

from their parents. Participants were from a wide range of family compositions; only child

participants (n=9), first-born participants (n=9), middle-child participants (n=5), and last-born

participants (n=9). Participants were recruited using the SONA system and were asked to take

part in a survey in a classroom with approximately 10 other participants. Participants' data was

only used if they were first year, female students who are living either at home, in residence for

the first time or living away from home for the first time. Because we were interested in people

who are transitioning from living at home as a high school student to becoming a university

student, mature students were not included. Participants were not compensated for their time but

did receive a credit towards their Psychology 1000 course. This was a voluntary study and

participants were able to leave or end the study at any point in time while still receiving their

class credit for Psychology 1000.

Materials

Participants were grouped into one of four groups (first born, middle child, youngest

child, or only child) based on their answers from a demographics questionnaire (Appendix A)

indicating their birth order, age, living location and other basic information. Participants were

also categorized based on their psychological birth order to examine the relationship between

perceived birth order and anxiety, accounting for different family compositions. The

Psychological Birth Order Inventory contains 46 questions regarding participants' feelings

towards their upbringing and family. The main measure of anxiety was the State-Trait Anxiety

Inventory. The State-Trait Anxiety Inventory is a two-part questionnaire composed of 40

questions, each measured on a 4-point Likert scale, of participants' current state anxiety

regarding their transition from high school to university, followed by their dispositional trait

anxiety. Participants' self-esteem was also measured on the Rosenberg Self-Esteem Scale. This

is a 10-question survey measured on a 4-point scale and was used to examine the relationship

between chronological birth order and psychological birth order results and self-esteem.

Procedures

Once participants were recruited for the study using the SONA system, they were asked

to come to a classroom in the St. James Building at a designated date and time. Before beginning

any surveys, participants were asked to carefully read and sign the letter of information followed

by the informed consent which outlined what will be required of them in the study. Participants'

informed consent forms were then coded with a number which was put on all their subsequent

surveys to ensure confidentiality of participants. After reading and signing the letter of

information and informed consent, participants were given a package of surveys including a brief

demographic questionnaire (Appendix A), The Psychological Birth Order Inventory, The State-

Trait Anxiety Inventory, and The Rosenberg Self-Esteem Scale. At the very beginning of the

Trait-State Anxiety Inventory, participants were asked to think back to when they first began

university to prime emotions that were felt in September. The surveys took approximately 15 to

20 minutes to complete. Upon completion of the listed surveys, participants were given a

debriefing form indicating the purpose of the study in which they took part.

Participants were assigned to three sets of groups based upon their biological birth order,

their psychological birth order, and their living location (independent variables). The dependent

variables in this experiment were participants' state anxiety, trait anxiety and self-esteem.

Results

All participants were first year female university students enrolled in psychology 1000 at

an all-women's college. A total of 32 participants (N=32) were surveyed, with a mean age of

18.5. Table 1 and Table 2 show the raw scores of participants in ache category either based on

both their biological birth order (Table 1) or psychological birth order (Table 2).

Biological Birth Order

A two-way analysis of variance was conducted on the influence of *biological birth order*

and living location on *state anxiety*. Birth order included 4 levels (only, first, middle, and

youngest) and living location consisted of three levels (residence, home and apartment). None of

the effects were statistically significant. The main effect for biological birth order yielded an F

ratio of $F(3, 21) = 0.50$, $p = .68$, indicating that the level of state anxiety did not significantly

differ between only children ($M = 49.40$, $SD = 15.25$), firstborns ($M = 50.44$, $SD = 11.20$),

middle children ($M = 42.20$, $SD = 8.50$), and youngest children ($M = 47.56$, $SD = 12.14$). The

main effect for living location yielded an F ratio of $F(2, 21) = 0.43$, $p = .65$, indicating no

significant difference between living in residence ($M = 49.77$, $SD = 4.27$), in an apartment off

campus ($M = 45.27$, $SD = 3.63$) and living at home ($M = 42.56$, $SD = 6.61$). Although results

were not significant for living location, results were trending towards residence invoking the

most state anxiety followed by an apartment and at home (see Figure 1). The interaction effect was not significant, $F (5, 21) = 0.79$, $p = .56$.

A two-way analysis of variance was conducted on the influence of *biological birth order* and living condition on *trait anxiety*. No effects were statistically significant. The main effect of birth order yielded an F ratio of $F (3, 21) = 0.46$, $p = .71$, indicating that trait anxiety did not significantly differ between only children ($M = 50.27$, $SD =5.1$), firstborns ($M = 49.93$, $SD = 4.2$), middle children ($M = 40.79$, $SD = 6.3$), and youngest children ($M = 47.44$, $SD = 4.1$). Although results were not significant, they trended towards showing that middle children have the lowest level of trait anxiety. The main effect for living location yielded an F ratio of $F (2, 21) = 1.63$, $p =.22$, indicating no significant difference between living in residence ($M = 53.1$, $SD = 4.1$), living in an apartment off campus ($M = 45.65$, $SD = 3.48$), and living at home ($M = 40.11$, $SD = 6.332$). The interaction effect between living location and biological birth order was also not significant, $F (5, 21) = 0.58$, $p =.71$.

A one-way analysis of variance was conducted to compare the effect of *biological birth order* of *self-esteem*. Biological birth order consisted 4 levels (only, firstborn, middle, and youngest) and self-esteem was the continuous variable with a maximum possible score of 20. An ANOVA showed that the effect of biological birth order of self-esteem was not significant, $F (3, 28) = 1.20$, $p = .33$.

Psychological Birth Order

A two-way analysis of variance was conducted on the influence of *psychological birth order* and living location on *state anxiety*. Participants were classified as either only children, firstborns, middle children or youngest children, comprising the four levels of psychological birth order. Living location consisted of three levels (residence, home and apartment) as with the

previous analysis. All effects were not statistically significant. The main effect for psychological

birth order yielded an F ratio of F (3, 21) = 1.87, p = .17, indicating state anxiety did not

significantly differ between psychologically only children (M = 50.90, SD = 6.34), psychological

firstborns (M = 44.8, SD = 4.6), psychological middle children (M = 31.5, SD = 8.87) and

psychologically youngest children (M = 53,89, SD = 5.66). Although not statistically significant,

these results trend toward what was hypothesized, with middle children having the lowest level

of state anxiety, followed by first born children and only children, and youngest children having

the highest level of state anxiety (see Figure 2). The main effect of living location yielded an F

ratio of F (2, 21) = 0.29, p = .76, indicating no significant difference in state anxiety between

living in residence (M = 48, SD = 4.2), living in an apartment off campus (M = 48.88, SD =

6.05), and living at home (M = 43.25, SD = 5.87). Although results were not significant, they

showed a trend that those living at home had the least state anxiety. The interaction effect

between living location and psychological birth order was also not significant, F (5, 21) = 0.21, p

= .96.

        A two-way analysis of variance was conducted on the influence of *psychological birth*

order and living location on *trait anxiety*. All effects were not statistically significant. The main

effect of psychological birth order yielded F (3, 21) =1.02, p = .40, indicating no significant

difference between psychologically only children (M = 53.22, SD = 6.01), psychologically

firstborns (M = 43.78, SD = 4.41), psychological middle children (M = 45.50, SD = 8.42), and

psychologically youngest children (M = 54.50, SD = 5.38). The main effect of living location

was also not significant, yielding an F ratio of F (2, 21) = 2.30, p = .13, signifying no significant

difference in trait anxiety depending on where the students lived. The interaction between living

location and psychological birth order did not yield significant results either, $F (5, 21) = 0.81$, p

$= .55$.

A one-way analysis of variance was also conducted to compare the effect of

psychological birth order on *self-esteem*. Psychological birth order consisted of 4 levels (only,

firstborn, middle, and youngest) and self-esteem was the continuous variable with a maximum

score of 20. ANOVA results showed that the effect of psychological birth order was not

significant, $F (3, 28) = 0.32$, $p = .81$.

Although results were not statistically significant, when psychological birth order was

taken into consideration, the percentage of participants at the greatest risk for high anxiety were

lastborn children. Psychological lastborn children had a 67% chance of having significant

symptoms of anxiety (see Figure 3).

Discussion

The results of this study were not statistically significant, and they did not support the

hypothesis that lastborn children would have higher levels of anxiety towards the transition from

living at home as a high school student to becoming a university student when compared to other

birth orders. There also did not seem to be a significant difference in anxiety levels depending on

where participant lived at university (i.e., home, off campus, or in residence). Self-esteem was

also examined and no significant difference between birth orders was discovered. Although no

results were found to be significant, there were some interesting trends in the data. When

biological birth order was examined, living in residence seemed to be the most anxiety

provoking for all birth orders, with the youngest children having the highest anxiety. First born,

only, and middle children followed nearly identical patterns of having the highest anxiety living

in residence, followed by living off campus, and the lowest anxiety living at home, as predicted

(see Figure 1). For both biological birth order and when psychological birth order was taken into consideration, first-born and only children scored almost identically on all measures of anxiety. As hypothesized, middle children presented the lowest levels of anxiety on all measures for both psychological and biological birth order. This relationship was only strengthened when psychological birth order was taken into consideration. With psychological birth order, abnormally high levels of either state or trait anxiety were noted and results trended towards lastborn children having the highest proportion of high anxiety. Self-esteem was another measure and results trended towards the youngest children having the highest level of self-esteem, middle children having the lowest level of self-esteem and first-born and only children scoring very similarly (see Figure 2). This may be an area for future research to see whether self-esteem is always better. From the results of this study, lower self-esteem related to lower levels of anxiety.

Although results were not significant, the trends seen in the data lean toward supporting past research in the area of birth orders effect on personality. Middle children consistently displayed the lowest level of state and trait anxiety, playing into their non-perfectionistic tendencies described by Rohrer et al., (2015). The results from middle children also trended towards confirming Adler's (1929) theory that middle children are to be more relaxed and easy going. This relaxed demeanor is thought to be a protective factor against psychiatric problems such as anxiety disorders (Carbello et al., 2013). In respect to the oldest and only children, these participants tended to score very similarly on all measures except for self-esteem which additionally fits well with past research. Oldest children scored very high on self-esteem, possibly reflecting their success from being adaptive perfectionists. Only children scored lower on self-esteem conceivably mirroring their maladaptive perfectionism traits (Gnilka et al., 2012). When just looking at biological birth order and anxiety scores for firstborns, only children and

youngest children, their anxiety scores for these three groups were all quite high, showing their

perfectionistic tendencies, regardless of *type* of perfectionism. These scores were possibly high

because they take school very seriously and have a need to succeed, making the transition from

high school to university more anxiety provoking than middle children, who tend to be non-

perfectionistic.

Anxiety for lastborn children was not the highest for biological birth order (firstborn

scores were highest) but when psychological birth order was accounted for, scores trended

towards being the highest. This supports the concept of Adler's birth order theory and the meta-

analysis by Eckstein (2000), that lastborn children lean towards having high levels of anxiety.

For both trait and state anxiety, the youngest children had an average score of 54 (slightly higher

for state) which is the cutoff score used to indicate higher than normal levels of anxiety and

could be investigated further to see if they have clinically significant anxiety symptoms or issues.

Youngest children were the only birth order to average a worrying anxiety score, fitting with

literature that found a higher proportion of anxiety and other psychiatric disorders among

youngest children when compared to other birth orders (Abdel-Khalek, 2002; Rice & Van

Arsdale, 2010). Last born children also gave themselves the highest self-reported anxiety rating

than any other birth order. These results may be showing youngest children's maladaptive

perfectionism where they set high goals and standards for themselves, in this case concerning

their commencement of university life. Perhaps they quickly felt like they have failed in some

way, leading to feelings of disappointment, low self-esteem, depression, anger with themselves

for their *perceived* failures, and increased stress levels (Gnilka et al., 2012; Rice & Van Arsdale,

2010).

Another interesting finding in the results was that the distribution of birth order was almost completely equal with biological birth order, but when psychological birth order was considered, there were very few psychologically middle children and many psychologically first-born children. This may be because participants were university students, and this population perhaps, on average, has personality traits more of a first born. To excel in a university setting, students must have a certain level of goal setting ability, determination, organization, and reliability—explaining the abnormally high level of psychologically first-born participants. Feasibly, if a more representative population was used (i.e., not solely university students), this drastic redistribution of birth order would not have occurred.

The only difference in the observed results of this study is that these feelings are often associated with low self-esteem, yet this group scored highest on self-esteem, which was an interesting finding. These findings, although not statistically significant, contribute to research by trending towards supporting past research which suggests middle children are least susceptible to anxiety problems, followed by first born children, only children, and lastly, youngest children being most vulnerable to high anxiety. A potential explanation for these observed results is type of perfectionism different birth orders can develop (Gnilka et al., 2012) possibly affecting how they perceive and react to new situations such as university.

A limitation in this study was the relatively small sample size. Perhaps if a larger sample size was used a significant effect between anxiety and birth order could have been detected. This is particularly relevant when comparing middle children to all other birth orders. Middle children appeared to have much lower anxiety than other participants, and clinically different according to the scoring index, yet this was not detected statistically. Another limitation in methodology was that participants were tested in late January and asked to recall their experience of starting

university in September. Perhaps if students were asked about their anxiety towards starting

university closer to when they actually started (e.g., mid-September) results may have been more

accurate and less susceptible to retrospective memory biases.

        An interesting area of future research would be the link between self-esteem and anxiety

levels. It is always assumed that the higher the self-esteem of people the better, however, results

from this study trended towards showing that those with higher self-esteem had higher anxiety. It

would be interesting to go into greater depth as to whether there are caveats to high self-esteem

always being beneficial. Perhaps high self-esteem is beneficial up to a certain point, or if it is

truly warranted based of certain skills someone has acquired, rather than simply concluding that

high self-esteem is better. It would also be interesting to develop education programs or support

systems within the universities to allow students better understand and manage issues regarding

perfectionism.

        The purpose of the current study was to determine if there was a predictable level of

anxiety among the various birth orders due to fostered personality types. The findings were not

statistically significant but displayed trends supporting past research. Results showed middle

children displaying the lowest level of anxiety towards beginning university, followed by only

children and first-born children with almost identical scores, and last-born children scoring the

highest on both state and trait anxiety. These results were strengthened when psychological birth

order was examined. Where participants were living also did not seem to have a statistically

significant impact on anxiety levels, however results trended towards living in residence being

the most anxiety provoking, followed by living off-campus and living at home leading to the

least anxiety among all birth orders except for youngest children, who found living at home to be

just as stressful as residence. Although last-born participants appeared to be the most anxious

group, they had the highest self-esteem. This was an interesting result and could be examined

further in future research. Other than the self-esteem results in this experiment, the results are

consistent with past research on perfectionism and birth order (Adler, 1928; Gnilka et al., 2012),

and past studies research showing that last-born children have a higher proportion of emotional

problems (Abdel-Khalek, 2002; Carballo et al., 2013). This study provides insight as to what

students may require additional support or training for university life and life beyond university.

Perhaps education on ways to manage the various types of perfectionism for first-borns, only

children and last-born students would be beneficial.

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Table 1

Raw Mean Scores for the Biological Birth Order of Participants

Biological Birth Order	Participants (n)	Mean State Anxiety	Mean Trait Anxiety	Mean Self-Esteem	Mean Self-Reported Anxiety	High Anxiety
Only	9	49.4	52.6	15.7	6.3	4/9
First Born	9	50.4	49.7	17.2	5.8	4/9
Middle	5	42.2	40.6	16	7	2/5
Youngest	9	47.6	47.4	17.7	7	5/9

Note. State and trait anxiety scores range from 20-80 with scores greater than 54 indicating clinically significant symptoms of anxiety. Self-esteem scores range from 0-30 with scores below 15 indicating low self-esteem. Self-reported anxiety was scored out of 10.

Table 2

Raw Mean Scores for the Psychological Birth Order of Participants

Psychological Birth Order	Participants (N)	Mean State Anxiety	Mean Trait Anxiety	Mean Self-Esteem	Mean Self-Reported Anxiety	High Anxiety
Only	5	52	53	16.2	5.8	2/5
First Born	19	46.6	45.9	16.9	6.5	3/7
Middle	2	31.5	45.5	15.5	5	1/2
Youngest	6	54.8	54	17	7.5	2/3

Note. State and trait anxiety scores range from 20-80 with scores greater than 54 indicating clinically significant symptoms of anxiety. Self-esteem scores range from 0-30 with scores below 15 indicating low self-esteem. Self-reported anxiety was scored out of 10.
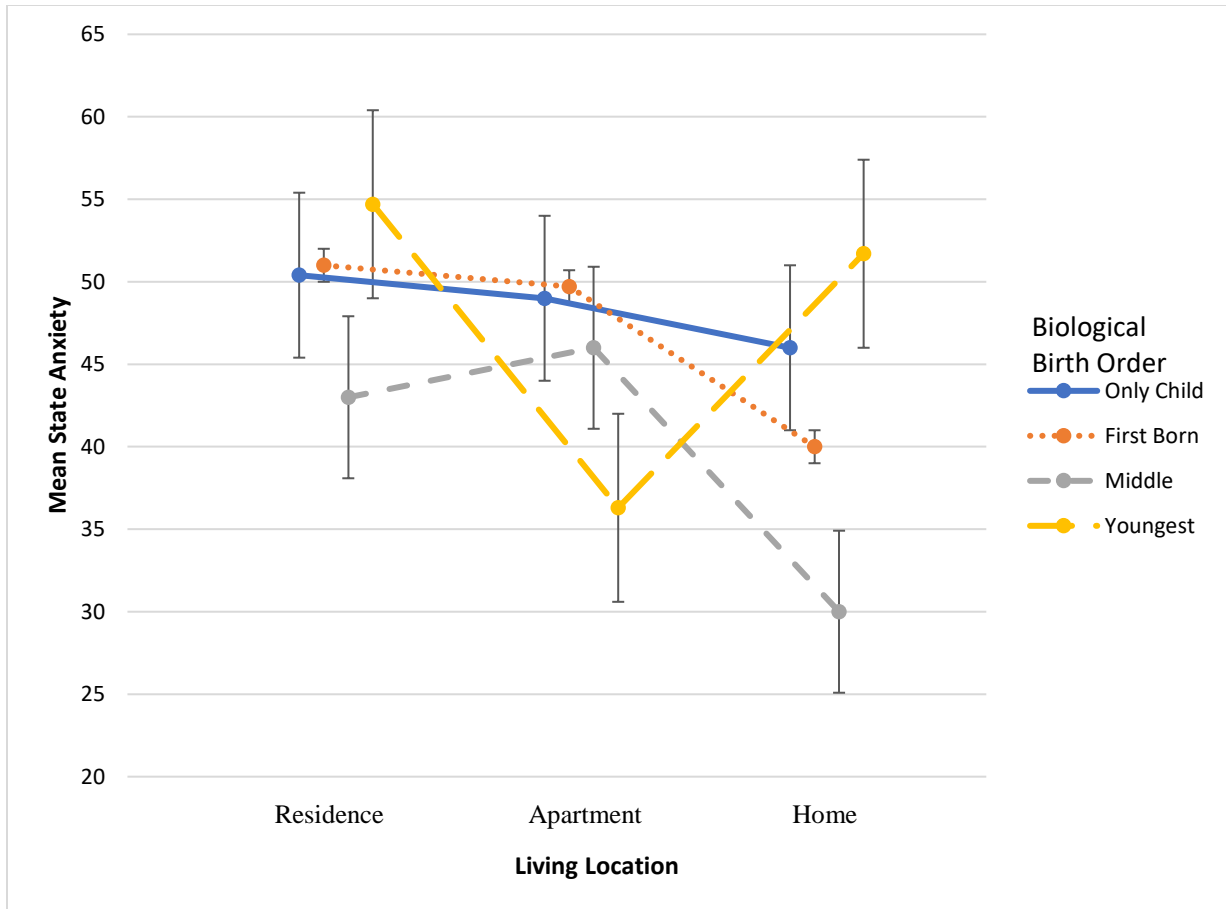
Figure 1. Mean state anxiety of university students categorized based on living location and biological birth order. Error bars indicate standard error of the mean. Points are offset horizontally so that error bars are visible.
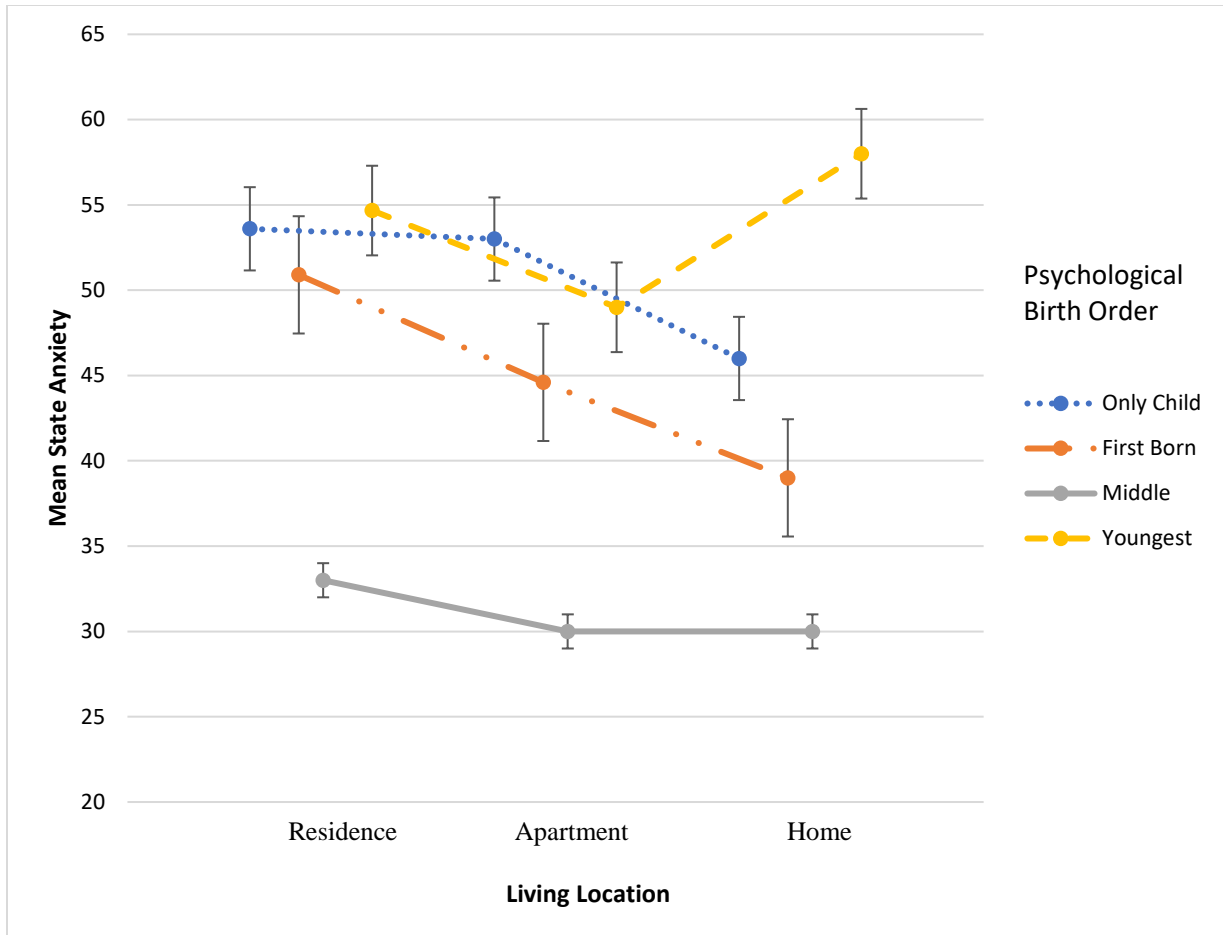
Figure 2. Mean state anxiety level of university students categorized based on psychological birth order and living location. Error Bars represent standard error of the mean. Points are offset horizontally so that error bars are visible.
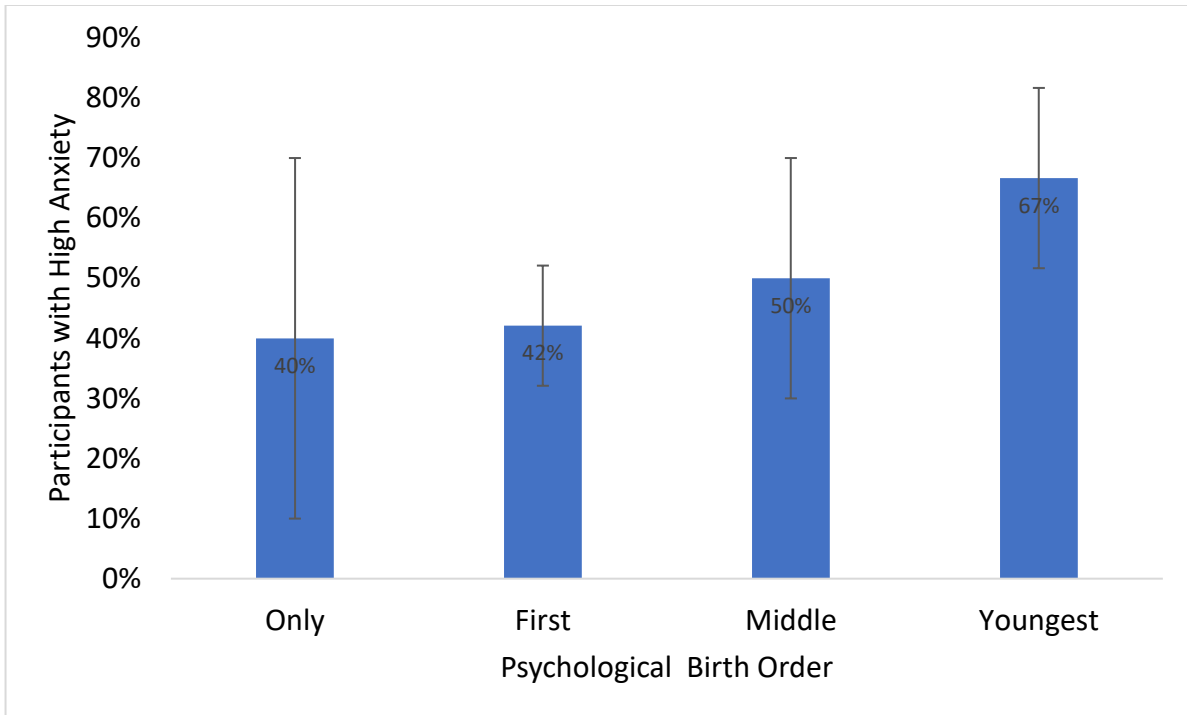
Figure 3. The percentage of participants who were categorized based on psychological birth order with clinically significant symptoms on either state or trait anxiety. Scores of higher than 54 indicated significant anxiety symptom's. Error bars represent standard error of the mean.

Appendix A
Demographic Questionnaire

Date: _____   Age: _____   Gender: _____

Are you a first-year university student (if no, please specify your year of study)?
_____

Is this the first time you are living away from home? _____

Do you live in Residence (e.g., Clare Hall)?_____

Please circle your birth order:
      (a)   Only Child
      (b)   First Born (oldest child in family)
      (c)   Middle Child
      (d)   Youngest Child

Please indicate the composition of children in your family and where you lie within that birth order (e.g., my parents had: boy, girl, girl, boy and I am the second girl).
_____
_____
_____

Did you find that when you were living at home, you were given more responsibilities than your other siblings?
_____
_____
_____

On a scale of 1 to 10 (with 1 being the least anxious and 10 being the most anxious), circle how much anxiety you felt toward starting university.
1   2   3   4   5   6   7   8   9   10