Examining the Relationship Between Birth Order and Personality and the Subsequent Influence of Complex Family Structure

Ella Penson

Paul D. Schreiber High School

Abstract

The purpose of this study was to see if birth order had an influence on the big five personality traits (Openness, Extraversion, Agreeableness, Neuroticism, Conscientiousness), and whether being in a complex family skewed this correlation. Complex families include divorce, death of a parent, introduction of step siblings. and being raised by a single parent. A demographic survey as well as the *MBTI Personality Type Indicator* questionnaire were constructed on Google Surveys and administered through Amazon's Mechanical Turk to 400 individuals. The remaining 70 accessed the survey through a shareable link. These participants ranged in age, residence, gender and birth order. The five sub scales corresponding to each trait were measured to determine whether a subject exhibited the trait or not. In order to test the correlation, a multivariate linear regression was run. There was significance for four out of five traits. To see the correlation in complex subjects, a series of t-Tests were run. Statistical significance was shown for three of five traits. The results suggest that being a first born makes it more likely to be conscientious but less likely for someone to be extroverted, open, agreeable, emotionally stable. Later borns, on the other hand, were more likely to be extroverted, open, agreeable, emotionally stable and less likely to be conscientious. Participants in complex families exhibited traits similar to later borns, being more likely to be extroverted, open and less likely to be conscientious. Birth order's effect on personality and the effect in a complex family can help provide insight into children's behavior. This study may allow parents to intervene in their children's life after a traumatic event such as divorce in order to minimize the psychological effects such as depression or anxiety and even rebellious behavior.

I. Introduction

Birth Order and Personality

A highly debated question in research is that of difference in personality between siblings. As most children within sibships[1] grow up in similar conditions and with similar resources, it is puzzling why they have such different personalities. The speculated theory of birth order influence was first introduced by Alfred Adler in the early 20th century. He hypothesized that the first born feels "dethroned" by the birth of the later siblings, which has a lasting effect on them. Further, the middle child often feels ignored and neglected, helping form their psyche. The later borns are often spoiled and given the most attention, giving rise to the term of favoritism. These circumstances, Adler argued, play a vital role in the development of the Big Five personality traits in people: openness, conscientiousness, extraversion, agreeableness and neuroticism. (Adler, 1928). Some typical traits that define "openness" are rebelliousness, openness to new experiences, liberality, nonconformity, and unconventionality. Secondly, those who are conscientious tend to be self-disciplined and act according to a thought-out plan rather than spontaneously. Third, a high score of extroversion would be representative of someone who is outgoing and social. Those who are extroverted like to be around people and are often natural born leaders. Agreeableness, the fourth of the Big Five personality traits, is defined by a warm, friendly and tactful demeanor. An agreeable person generally has an optimistic view of human nature and gets along well with others. Those who have a low level of agreeableness are often selfish, distant and uncooperative. Neuroticism, the final trait within the Big Five personality theory, is virtually a scale of emotional stability. A

[1] Sibship: a group of offspring having the same or in the care of two parents.

person high in neuroticism easily experiences negative emotions. A person with low neuroticism is more stable, calm and less prone to bad feelings. These five traits are widely accepted to be the defining sections of each person's personality. Although there is a spectrum, for purposes of research, each person either does or does not display each of the five traits. Birth order position research suggests that first borns exhibit some of the five traits while later borns exhibit the others. The study of the effect of birth order has gained momentum since the publication of Frank Sulloway's book, *Born to Rebel,* in 1996. Original solutions to this question of birth order effects on personality include environmental theories as well as genetic theories (Beer & Horn, 2000; Jang, Livesley, & Vernon, 1996). However, multiple studies have shown that genetics play a very small, if any, role in personality, while environment seems to have much more influence (Dunn & Plomin, 1991).

Big Five Personality Traits and Birth Order

Birth Order and Openness

First borns tend to score lower on measures of openness. This has been supported by several empirical studies such as one by Russell Eisenmen. In his 1964 study on birth order and artistic creativity, he found that first borns tend to be more conservative and traditional than their sibling counterparts (Eisenman, 1964). Further, psychologist Frank Sulloway, in his nonfiction book, *Born to Rebel,* found that later borns tend to score higher on measures of openness than first borns(Sulloway, 1996). This difference in the exhibition of openness within sibships may be explained by a developed theory that people guide their morals based on either "ethics of personal conscience" or "ethics of social responsibility." In a 1971 study by Professor A.P. MacDonald Jr., it was found that first-borns are more likely to follow the conforming system, or

their “social responsibility.” Later borns, on the other hand, are more rebellious and more willing to change the system thus following their “personal conscience” (Macdonald Jr., 1971). Healey and Ellis had similar findings in 2007, when they found that firstborns scored significantly lower than their second born siblings on Openness to Experience tests (Healey & Ellis, 2007). This lack of openness in first borns makes them less likely to partake in so-called “bad behavior” and more likely to follow the commands of the parent/guardian (Wood & Kennison, 2018).

Birth Order and Conscientiousness

Conscientiousness combines responsibility with organization and scholastic achievement (Healey & Ellis, 2007). Adler found that first borns tend to score higher on tests of conscientiousness (Adler, 1928). He further found that conscientiousness is directly related to academic achievement. Not only is it noted that first borns usually score higher on psychometric intelligence tests, they also correspondingly score higher on intellect tests. Intellect is a self-reported trait correlated with objectively measured intelligence. Psychometric Intelligence, also known as IQ, is a measure of cognitive ability and intelligence. (Sulloway, 1996). There is an observed effect of ~1.5 IQ points for each increasing birth-order position (Rohrer, Egloff. & Schmukle, 2015). In fact, this finding was again noted and supported in the 2007 study by Healey and Ellis. They noted that conscientiousness and academic curiosity was greatest in firstborns. Academic curiosity is defined by asking questions, actively participating in class discussions, and performing well on standardized tests. A possible explanation for the differences of this trait within any sibship is that of the Confluence Model proposed by R. Zajonc. The model states that the average intellectual age of the family decreases as additional children are born. The effect is all the greater if the siblings are closer in age (Zyrianova,

Chertkova, & Pankratova, 2013). This theory may be helpful in explaining why first borns tend to score greater in academic achievement and conscientiousness than their later born counterparts.

Birth Order and Extroversion

The relationship of extroversion to birth order is more complicated than the other traits. In leadership positions, comes the tendency to yearn for dominance, as many extroverts do. While it is the case that first borns tend to be much less extroverted than later borns, they are more dominant within the family (Sulloway, 1996). In social gatherings, however, first borns are much more comfortable in groups where they can easily conform or blend in. A first born at a party will most likely interact with the few people he/she knows rather than branch out (Eisenman, 1964). Later borns, on the other hand, are great at socializing and initiating conversations (Asendorpf, 1986). Even in the realm of everyday life, later borns are the least shy of all siblings (Stansbury & Coll, 1998). A reason for shyness in first borns may be the greater tendency of these children to have anxiety (Maccoby & Jacklin, 1974). This anxiety prevents them from interacting with more strangers and becoming less introverted. A more general theory as to why first borns are less extroverted is that at one point in time, they were the sole targets of their parent's attention at a point in time. This constant ability to have the attention of parents makes first borns less likely to branch out and improve social skills (Stansbury & Coll, 1998). These findings make it surprising that first borns tend to be the most dominant within sibships. A possible explanation is that first borns, who as mentioned before were once the only children within the family, perceived their guardians' parenting styles as more strict than later borns. Firstborns often feel as if their parents tried to completely control and dominate them. As

additional children are introduced within the familial system, there is less attention towards each individual child and the first borns feel as if they were treated unfairly. They then emulate what they perceived as dominance from their parents upon their siblings (Pollet, Barelds, & Buunk, 2010).

Birth Order and Agreeableness

According to a conducted meta-analysis by Frank Sulloway, first borns have the lowest level of agreeableness (Sulloway, 1996). On a self-reported personality test, first borns themselves indicated that they had the lowest agreeableness within their own families (Michalski & Shackelford, 2002). Mothers, when questioned, relayed that their later borns were more agreeable, warm and tender-minded than their first born counterparts (Saroglou & Fiasse, 2002). A possible explanation for this phenomenon is that later borns are more agreeable and altruistic as they grow up listening to their older siblings. The abiding to commands and directions of older siblings often results in a more easy going and agreeable laterborn (Kennison & Wood, 2018). The aforementioned finding that first borns tend to be more driven in their academic pursuits may also explain why first borns score lower on measures of agreeableness. Since first borns are so goal-oriented, they may often overlook the feelings of others as they are preoccupied by their goals. Another reasoning may be their dominance within sibships. As first borns are commonly natural leaders, their control over siblings may make them seem less agreeable or warm and instead, more demanding and cold-natured (Pollet, Barelds, & Buunk, 2010).

Birth Order and Neuroticism

A study done by Kathleen McCormick and Daniel Baer through Boston College with 120 college students found that first-borns tend to score higher on tests measuring neuroticism (McCormick & Baer, 1975). In addition, a meta-analysis done by Alan Feingold with over 5,000 participants determined that first borns are much more prone to anxiety and self-esteem issues than their younger siblings (Feingold, 1994). In fact, first borns tend to have more internal or emotional problems in general than any other children within families. (Mostafa, Gambaro & Joshi, 2018). Sulloway also predicted that later borns have the lowest amounts of neuroticism (Sulloway, 1996). However, it is also noted that later borns are usually more depressed, vulnerable, impulsive, and self-conscious (Sulloway, 1996). This is an interesting finding as first borns score higher on neuroticism tests and are more prone to anxiety. Thus, it is difficult to grasp how large the effect of birth order is on the neuroticism personality type. Nevertheless, it seems first borns, although less likely to have the aforementioned traits, are typically more neurotic emotionally.

The Effect of Birth Order Within Complex Familial Structures

As time has progressed, complex familial structures have become increasingly normalized. In fact, approximately one in two marriages ends in divorce (Research on Marriage Divorce, American Psychological Association) . This paves the way for a more contemporary family, which differs from nuclear families seen in previous decades. Families separating in the early years of a child' s upbringing have numerous psychological and developmental effects on said children.

However, divorce is not the only event that falls into the category of a contemporary familial structure. Others include the death of a parent, the addition of step siblings, and single

parenting. Because these types of family structures have significant psychological effects on children, they may alter the effects of birth order. Within these families, do all children act more like later borns? Or do they inherit typical first born traits? One theory that seeks to explain why first borns are more introverted and later borns are more social is the Resource Dilution Model by J. Blake. It states that as successive children are born, there are fewer resources and attention to go around. And, as later borns receive less attention from parents, they branch out and seek that missing attention within social settings (Zyrianova, Chertkova & Pankratova, 2013). This explanation leads many to think that if children are raised by a single parent or lose a parent through death/divorce, they will act more like a later born. This is also supported by the finding that children in single parent homes had lower results than children in intact homes on IQ tests (Rohrer, Egloff. & Schmukle, 2015). In fact, it seems students in intact homes are more driven in general to gain knowledge. A 2016 study involving 360 students found that children in stable homes were more curious and participated in classroom discussions more than children with divorced parents (Natasha Bi & Sivanjali Gounder, 2016). Furthermore, a notion supported is that children with "broken homes" tend to have more behavioral problems. They are also more vulnerable to emotional challenges such as depression and anxiety (Peretti & Di Vittorio, 1993). Further, these risks are heightened when children live with a single parent and non-full siblings as exhibited by a 2013 study with 19,000 participants (Mostafa, Gambaro, & Joshi, 2013). Not only do internal problems like depression and anxiety increase within siblings in broken homes, so do external problems. These include rebellious behavior, lashing out at others, and making poor decisions (Natasha Bi & Sivanjali Gounder, 2016). As previously mentioned, rebellious behavior is more common in later borns than earlier borns. Further, feelings of depression are

also more common in later borns. This evidence seems to indicate that siblings in complex families, although all different, act more, as a group, like later borns.

Hypotheses

1. First borns will score significantly lower on the subscales of openness, extraversion and agreeableness, and neuroticism on the MBI than later borns.
2. First borns will score significantly higher on the subscales of conscientiousness than later borns.
3. First borns in complex familial structures will exhibit qualities of later borns rather than of a typical first born.

II. Methodology

Participants

A total of 470 subjects participated in the study. Subjects ranged in age from 18 to "65+". The mean age of participants was 42 years old. 67% of participants were female, 32.1% were male and .8% reported that they identified as non-binary. The majority of subjects were from the USA (76%), 14% were from India, and a variety of countries made up the remaining 10%. All subjects grew up within "medium income" families.

Of the 470 participants, 38.6% (182) were first borns, 35.3% (165) were second borns, 16.7% (78) were third borns, 5.6% (26) were fourth borns and an additional 1% (7) identified as either an only child or fifth borns. The remaining small percentage (1.4%) of the subjects were later births within their sibships. The age spacing between the subject and their nearest sibling was also taken into consideration and these responses ranged from 11 months to 32 years. Subjects who were more than 8 years younger than their nearest older sibling were counted as

first borns. Although the overwhelming majority of participants were not twins or triplets (96.7%), 11 subjects (3.1%) identified as twins and 1 (0.3%) identified as a triplet.

One hundred of the participants were classified as being a part of a complex familial structure. This included participants from divorced families and/or guardians other than two parents. More specifically, 52 of these 100 subjects had divorced parents. The other 48 grew up with either a single mother or single father. Thirty-eight of the 100 complex family participants were first borns. The remaining 62 were later birth positions within their sibships.

Materials and Procedure

All participants received the same composite survey inquiring about various demographics as well as the Myers-Briggs personality test. The majority of subjects (400) accessed the survey through Amazon's survey administrator, Mechanical Turk for a reward of five cents. The other 70 accessed the survey through a shareable link. At the beginning of the survey, a brief paragraph explained the purpose of the study and that all answers were anonymous.

The demographic section of the survey was utilized to gather information on each participant's family structure. This included questions regarding gender, profession of guardians, area of residence, and age. Furthermore, the study aimed to collect information on family structure through inquiry of the birth order position of each subject as well as the birth order position of their guardians. In addition, subjects were asked who their primary guardians were, and if their caretakers separated or divorced while they were growing up. Further, the survey inquired about whether participants grew up in one home, or with step siblings.

The second half of the survey was an assessment of the personality type of each participant. The purpose of the *Myers-Briggs Type Indicator* personality inventory is to measure the psychological types described by C. G. Jung and make them understandable and useful in people's lives (Briggs & Myers, 1945). The questionnaire produces results by examining the ways individuals prefer to use their perception and judgment. This, in effect, illustrates the differences in the big five personality traits in each person: openness, conscientiousness, extraversion, agreeableness and neuroticism. The measure is composed of 70 items based on a two answer scale. From each prompt, participants choose one of two answers that best describes themselves. An example of a prompt is, "Would you say you are more…" and examples of responses would be "serious and determined," or "easy-going." The measure is scored based on a chart with 5 columns measuring each trait. Each column consisting of 14 questions is scored to reveal how a person is categorized within each of the "Big 5" personality traits. This is done by adding up the A's and B's within each column and identifying whether the subject exhibits the trait or not. Overall, the test analyzed how each subject makes decisions, behaves in social settings, interacts with others and manages their own feelings.

Data Analysis

This study sought to analyze whether there was a correlation between birth order and each personality trait rather than general personality type; thus birth order was analyzed with subscores of the *Meyer's Briggs Inventory,* or each of the 5 big personality traits. In this way, it is possible to see more accurately if each participant demonstrated the trait indicative of a first born or later born. To conduct the analysis, 370 subjects' results were analyzed. This did not include those who come from a complex family. A multivariate linear regression analysis was

performed for openness, conscientiousness, extraversion, agreeableness and neuroticism. For the analysis, birth order served as the independent variable and each personality trait as the dependent variable.

Each birth order position and resulting trait were recorded into Microsoft Excel numerically. Birth order position was characterized as either 1, a first born, or 2, a later born. For each trait, subjects results were either characterized as a 1 or 2. A result of extraverted, open, neurotic, conscientious, and agreeable were coded into Microsoft Excel as 1. Results of introverted, unopen, unneurotic, unconscientious, and unagreeable were coded into Excel as 2. After the Multivariate Linear Regression was run, a p-value of less than .05 demonstrated significance for each variable as well as the calculated equation.

The second set of comparisons was done solely on participants within complex familial structures. This included subjects whose parents separated while growing up, subjects who grew up in more than one home, subjects who had step or half siblings and subjects who grew up with guardians other than their parents. In total, these participants numbered 100 subjects. For this group, a One-Sample t-Test was manipulated to assess the difference in means between complex family traits and the hypothesized trait results. For example, subjects within complex families were hypothesized to be more open like later borns. As being open was coded into Excel as 1, the variance was calculated for the openness of complex family subjects. The predicted result is that all subjects would have traits similar to laterborns. It was predicted there would be little variance and a statistically insignificant difference between the results in personality for each subject regardless of birth order.

III. Results

Birth Order and Personality

A multivariate linear regression analysis was run in which birth order was the predictor variable (independent variable) and each personality trait served as the dependent variables.One equation was generated to measure significance. Four out of the five personality traits demonstrated significance (See Figure 3). These include openness, extraversion, agreeableness and neuroticism. Of the 143 first borns, only 11 (8%) scored were open on the personality type indicator, while 190 (85%) of later borns were (p=0.00343). For the trait of extraversion, out of 143 first borns, only (12%) exhibited the trait while 170 of 224 later borns (76%) were extraverted (p=0.00005). For neuroticism, 51 (36%) of 143 first borns tested positively for the trait while 157 (70%) of later borns scored as neurotic (p=0.00123). For agreeableness, 29 (20%) of first borns scored positively on the subscale while a much higher number was recorded for later borns as 204 (90%) of those subjects exhibited the trait of agreeableness (p=0.00018). In summary, each of these regressions demonstrated that if a subject was first born, they were less likely to exhibit the traits of openness, extraversion, agreeableness and neuroticism. The inverse is true as well as a later born was more likely to be open, extraverted, agreeable, and neurotic. Therefore, for each of these traits, the null hypothesis was rejected.

For the trait of conscientiousness, birth order had no significant effect on outcome of the trait in subjects. Only 75 (52%) of first borns exhibited conscientiousness after taking the personality indicator, which is lower than originally expected. Furthermore, a higher amount that predicted later borns exhibited the trait, with 132 (58%) doing so (p= 0.60092). The null hypothesis was accepted.

Figure 2: Later born result percentiles

Traits	Exhibited trait	Did not exhibit trait	Totals
Openness	190 (85%)	37 (15%)	227
Extraversion	170 (76%)	57 (24%)	227
Neuroticism	157 (69%)	70 (31%)	227
Agreeableness	204 (90%)	23 (10%)	227
Conscientiousness	132 (58%)	95 (42%)	227

Figure 1: First born result percentiles

Traits	Exhibited trait	Did not exhibit trait	Totals
Openness	11 (8%)	132 (92%)	143
Extraversion	17 (12%)	126 (88%)	143
Neuroticism	51 (36%)	92 (64%)	143
Agreeableness	29 (20%)	114 (80%)	143
Conscientiousness	75 (52%)	68 (48%)	143

Figure 3: Multivariate Linear Regression table

Multivariate Linear Regression

Independent variable	Birth Order
Dependent variables	Extraverion, Openness, Neurotocism, Agreeableness, Conscientiousness
N	370

Regression Statistics

R	0.84469	***R-Squared***	**0.7135**	*Adjusted R-Squared*	0.68962
MSE	0.07416	***S***	**0.27232**	*MAPE*	12.57221
Durbin-Watson (DW)	2.75144	*Log likelihood*	-4.65328		
Akaike inf. criterion (AIC)	0.32283	*AICc*	0.33798		
Schwarz criterion (BIC)	0.52189	*Hannan-Quinn criterion (HQC)*	0.40148		
PRESS	5.77147	*PRESS RMSE*	0.29571	*Predicted R-Squared*	0.62837

Birth Order = 2.77434 - 0.3693 * Birth Order and Extraverion - 0.34197 * Birth Order and Openness + 0.32258 * Neurotocism - 0.47532 * Agreeableness + 0.03607 * Conscientiousness

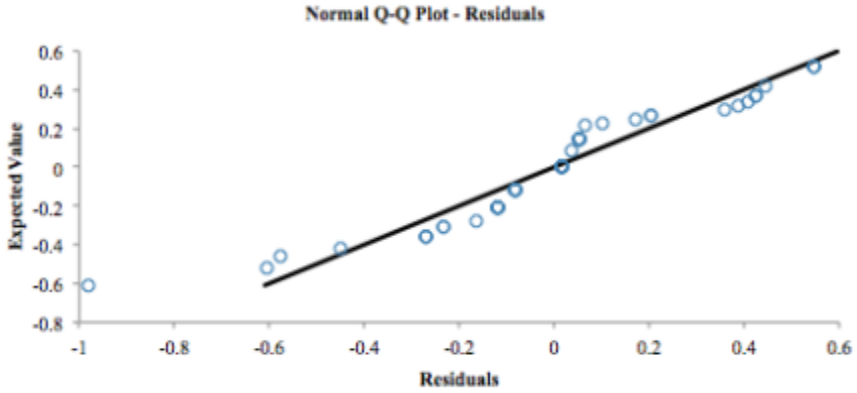
ANOVA

	d.f.	*SS*	*MS*	*F*	*p-value*
Regression	28	11.08083	2.21617	29.88441	0.
Residual	341	4.44948	0.07416		
Total	369	15.5303			

	Coefficients	*Std Err*	*LCL*	*UCL*	*t Stat*	*p-value*	*H0 (5%)*	*VIF*	*TOL*
Intercept	2.77434	0.16712	2.44005	3.10864	16.60066	0	*Rejected*	**	**
Birth Order and Extraverion	-0.3693	0.08441	-0.53814	-0.20046	-4.37527	0.00005	*Rejected*	**	**
Birth Order and Openness	-0.34197	0.11222	-0.56645	-0.1175	-3.0473	0.00343	*Rejected*	**	**
Neurotocism	0.32258	0.09507	0.13241	0.51275	3.39314	0.00123	*Rejected*	**	**
Agreeableness	-0.47532	0.11905	-0.71345	-0.23719	-3.99274	0.00018	*Rejected*	**	**
Conscientiousness	0.03607	0.06859	-0.10114	0.17328	0.52587	0.60092	*Accepted*	**	**
T (5%)	2.0003								

LCL - Lower limit of the 95% confidence interval
UCL - Upper limit of the 95% confidence interval
*** - Requires Pro version, please upgrade.*

Figure 4: Multivariate Linear Regression Model



Complex Family, Birth Order, and Personality

A series of One-Sample: t-Tests were run and a series of one-tailed p tests were calculated in order to test the hypothesis. A p-value of greater than .05 demonstrated significance as this represented an insignificant variance from the hypothesized value. Three out of five traits (openness, extraversion, neuroticism) were insignificantly different from this value, supporting the hypothesis. Of the 100 complex subjects, only 6 (6%) were not open (p=0.080). For the trait of extraversion, out of the 100 subjects in complex families, 90 (90%) exhibited the trait (p=0.083). For the trait of neuroticism, 77 (77%) of the 100 subjects in complex families were neurotic (p=0.059). The variances from the hypothesized value for each of these traits was relatively small, supporting the original hypothesis that all subjects in complex families would exhibit typical traits of later borns (0.064, 0.129, 0.200, respectively).

For two of the five personality traits (agreeableness and conscientiousness) there was a significant difference between each trait and the hypothesized value. A p-value of less than .05 represented this significant difference as well an acceptance of the null hypothesis. Of the 100 subjects in a complex family, only 33 (33%) of participants demonstrated the personality trait of

agreeableness on the personality indicator (p=4.36E-8). In regards to conscientiousness, 55 (55%) of 100 complex family subjects exhibited the trait (p=0.00019), a greater percentage than originally predicted. The variances from the hypothesized value were relatively large indicating a departure from the original hypothesis and supporting the null hypothesis (0.240 and 0.262, respectively).

Figure 5: Complex family result percentiles

Traits	Exhibited trait	Did not exhibit trait	Totals
Openness	94 (94%)	6 (6%)	100
Extraversion	90 (90%)	10 (10%)	100
Neuroticism	77 (77%)	23 (23%)	100
Agreeableness	33 (33%)	67 (67%)	100
Conscientiousness	55 (55%)	45 (45%)	100

Figure 6: t-Test p-values

Personality traits	P(T<=t) one-tail
Openness	0.080394104
Extraversion	0.082858897
Agreeableness	4.36E-08
Neuroticism	0.005912951
Conscientiousness	0.000189734

IV. Discussion

Typical birth order theories would hypothesize that first borns tend to be more conscientious but less open, extroverted, neurotic, and agreeable. Later borns, on the other hand, tend to exhibit the exact opposite traits. This trend, however, was not seen in the complex family

group. For three of the five personality traits (openness, extraversion, neuroticism), all participants within complex families regardless of birth order, demonstrated typical later born traits. This was in accordance with the original hypothesis and may be explained by the Resource Dilution Model. As an increasing number of children are born, there are fewer resources to go around. Due to this lack of attention from parents, later borns reach out and try to find that missing attention within social settings (Zyrianova, Chertkova & Pankratova, 2013). This explains the notion that if children are raised by a single parent, lose a parent through death/divorce, or have new step siblings introduced, they will act more like a later born and be more extraverted. Participants in complex families exhibited the traits of later borns in the sense that they were more neurotic and open. Children in "broken" homes tend to experience more negative emotions than children in stable homes. These problems include heightened instances of depression and anxiety (Peretti & Di Vittorio, 1993). These behavioral problems are not limited to internal feelings, but to external problems as well. This is characterized by irresponsible decision making, rebellious behavior and lashing out (Natasha Bi & Sivanjali Gounder, 2016). As previously mentioned, rebellious behavior is more common in later borns than earlier borns as is negative feelings such as depression and anxiety, indicative of high neuroticism.

However, subjects within complex families did not exhibit two traits common of later borns (agreeableness, conscientiousness), failing to support the hypothesis. Although later borns tend to be more agreeable, the behavioral problems children in complex families experiences result in a less agreeable demeanor. A 2004 study of 200,000 subjects found that children who experienced divorce, single parenting, the death of a parent, or introduction of step siblings became angrier and less agreeable (Gyoung & Yun, 2004). This would explain why the subjects

in complex families were less agreeable, in contrast to typical later borns. According to a 1999 study, both later borns and students in complex families tend to exhibit lower levels of academic determination and conscientiousness (Fitzgerald, Mann & Barrat, 1999), but the data in this study did not corroborate this finding. However, this may be explained by extenuating factors that affect conscientious in children. A 2018 study found that children growing up in different states within the country, as well as different areas in the world, had inherently different IQs and differed in measures of conscientiousness (Kanazawa, 2008). As this current study was not limited to one state or even the United States, the location of subject's residence was not accounted for in the analysis. For a trait like conscientiousness that is tied to academic success and IQ, areas of residence may have played a part and altered effects, explaining the lack of significance.

V. Application

The human psyche is extremely complex and intricate. Scientists often debate what shapes and influences a person's eventual personality. Further, many researchers aim to find indicators in early life of poor mental health as well as potentially dangerous habits. Birth order may be an effective way to do so. Many studies have found birth order to be correlated with higher neuroticism and reckless behavior in later borns. Studies have found that later-borns feel neglected and often perceive older siblings to harbor the favoritism of their caretakers which leads to instances of rebellion and lashing out (Sulloway 1976). These theories may allow parents to analyze their children's behavior and prompt them to monitor those children, later borns, with greater care (Natasha Bi & Sivanjali Gounder, 2016). This may be useful to schools

as well. If a counselor or educator at a school witnesses a child exhibiting these behaviors, the theories of birth order may provide more insight into why they are taking such actions.

Further, in an ever-evolving modern America, complex family structures become increasingly prevalent. If there is research on what the psychological effects on children could be, this would allow parents to be more equipped to predict behavior in their children. For example, children in complex families often have increased emotional instability, feelings of depression and partition in rebellious behavior (Peretti & Di Vittorio, 1993). Theories such as those presented in this paper could allow parents to predict the detrimental effects of a complex family sooner and provide resources to their children. This may include more of their time, increased surveillance over their children to assure their wellbeing or an addition of resources. This may include someone to talk to such as a therapist or psychologist.

VI. Limitations

A limitation of this study is its failure in accounting for other possible factors for variance in personality. These include gender, family dynamics and environment variables within as well as outside the household. Another limitation lies within the actual collection of data for the study. The majority of subjects took the questionnaire through the Amazon survey provider, Mechanical Turk, thus there is no way to tell how quickly subjects read over the questions or whether they were answering truthfully. As there was no way of determining whether subjects took their time on the survey, it is possible some may have answered rapidly. Moreover, the survey was taken by participants from several different countries. The wording of each question was quite complex and some subjects may not have understood well enough to accurately and completely respond. Furthermore, self-perception is certainly a limitation. It is evident that

people may see and perceive others differently than how they might self-analyze.There are a number of response biases that impact self-report methodology. Thus includes social desirability which is making yourself appear better in the grader's, as well as one's own eyes. Many do not answer truthfully on personality tests in fear of shining themselves in a bad light. Therefore, some participants may have answered untruthfully.

Further, much of the research providing background and insight for the predicted hypotheses is outdated. Many studies done on the influence of birth order position are from the 1980s and 1990s. Perhaps the effects of birth order have faded or altered over time. As a 2017 study found that the internet fosters aggression, unagreeableness and introversion in children, the advent of a much more technology dependent society may have changed the influence of birth order position within sibships (Aboujaoude, 2017). A related limitation is the general lack of recent research on birth order. Further, although there was a revived interest after the publication of Frank Sulloway's *Born to Rebel,* there still have only been a select number of studies published after his publication. Thus, much of the background for this study is based on many dated articles and journals.

VII. Further Research

Further research should analyze what skews and affects the power of birth order position. What exactly are the boundaries of the influence of birth order? Studies have been done on how birth order position affects intelligence, conservativeness and even piousness in different sibships. It would be interesting and beneficial to see what other effects birth order has later in life. For example, little has been researched on whether first born or later born children fare better in long term relationships. Perhaps birth order influences who each child looks for in a

partner. However, it is important to not solely exam how birth order affects each person's lives but also what changes and alters its power. For example, does the gender of each child within the sibship enhance or subdue the influence of birth order position? It is important to research these questions in order to completely understand how birth order shapes personality in each child. Since birth order is the earliest influence on personality, it is vital to study and as there is a lack of research within these fields, it is important to collect data on and try to answer these questions.

VIII. Conclusion

There was demonstrated significance between birth order and four out of five personality traits. These included agreeableness, openness, extraversion, and neuroticism. Birth order, however, had no significant influence on conscientiousness. For complex families, subjects exhibited typical traits of later borns for three out of five personality traits. These were extraversion, openness, and neuroticism. For agreeableness and conscientiousness, there was a significant variance from the hypothesis. Lack of agreeableness in complex family subjects may be explained by the increased behavioral and mental problems within children who experience trauma. For conscientiousness in both complex family subjects and in accordance to birth order as a whole, unaccounted factors may have played a role in the lack of significance. The three hypotheses were mainly accepted from the results.

References

(n.d.). Retrieved from https://www.apa.org/topics/divorce/.

(n.d.). Retrieved from https://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/original-research.htm?bhcp=1.

Aboujaoude, E. (2017). The Internet's effect on personality traits: An important casualty of the "Internet addiction" paradigm. *Journal of Behavioral Addictions*, *6*(1), 1–4. doi: 10.1556/2006.6.2017.009

Asendorpf, J. B. (1986). Support by parents, classmates, friends and siblings in preadolescence: Covariation and compensation across relationships. Journal of Social and Personal Relationships, 14, 79–93.

Beer, J. M., & Horn, J. M. (2000). The Influence of Rearing Order on Personality Development Within Two Adoption Cohorts. *Journal of Personality*, *68*(4), 789–819. doi: 10.1111/1467-6494.00116

Bi, N. N., & Gounder, S. S. (2016). Personality Development: Assessing the Effects of Single Parent. Families on Students Personality. *International Journal of Humanities and Social Science Invention*.

Dunn, J., & Plomin, R. (1991). Why Are Siblings So Different? The Significance of Differences in Sibling Experiences Within the Family. *Family Process*, *30*(3), 271–283. doi: 10.1111/j.1545-5300.1991.00271.x

Eisenman, R. (1964). Birth order and artistic creativity. *Journal of Individual Psychology, 20*(2), 183-185.

Feingold, A. (1994). Gender differences in personality: A meta-analysis. *Psychological Bulletin*, *116*(3), 429–456. doi: 10.1037/0033-2909.116.3.429

Fitzgerald, H. E., Mann, T., & Barratt, M. (1999). Fathers and infants. *Infant Mental Health Journal*, *20*(3), 213–221. doi: 10.1002/(sici)1097-0355(199923)20:3<213::aid-imhj1>3.0.co;2-g

Healey, M. D., & Ellis, B. J. (2007). Birth order, conscientiousness, and openness to experience. Tests of the family-niche model of personality using a within-family methodology. *Evolution and Human Behavior*, *28*(1), 55-59. https://doi.org/10.1016/j.evolhumbehav.2006.05.003

Jang, K. L., Livesley, W. J., & Vernon, P. A. (1996). Heritability of the Big Five Personality Dimensions and Their Facets: A Twin Study. *Journal of Personality*, *64*(3), 577–592. doi: 10.1111/j.1467-6494.1996.tb00522.x

Kanazawa, S. (2008). Temperature and evolutionary novelty as forces behind the evolution of general intelligence. Intelligence, 36(2), 99–108. doi: 10.1016/j.intell.2007.04.001

MacDonald, A. P. (1971). Birth order and personality. *Journal of Consulting and Clinical Psychology, 36*(2), 171-176. doi: 10.1037/h0030717.x

Mccormick, K., & Baer, D. J. (1975). Birth Order, Sex of Subject and Sex of Sibling as Factors in Extraversion and Neuroticism in Two-Child Families. *Psychological Reports*, *37*(1), 259–261. doi: 10.2466/pr0.1975.37.1.259

Michalski, R. L., & Shackelford, T. K. (2002). An Attempted Replication of the Relationships between Birth Order and Personality. *Journal of Research in Personality*, *36*(2), 182–188. doi: 10.1006/jrpe.2001.2350

Mostafa, T., Gambaro, L., & Joshi, H. (2018). The Impact of Complex Family Structure on Child Well-being: Evidence From Siblings. *Journal of Marriage and Family*, *80*(4), 902–918. doi: 10.1111/jomf.12456

Peretti, P. O., & Vitorrio, A. D. (1993). Effect Of Loss Of Father Through Divorce On Personality Of The Preschool Child. *Social Behavior and Personality: an International Journal*, *21*(1), 33–38. doi: 10.2224/sbp.1993.21.1.33

Pollet, T. V., Dijkstra, P., Barelds, D. P., & Buunk, A. P. (2010). Birth order and the dominance aspect of extraversion: Are firstborns more extraverted, in the sense of being dominant, than laterborns? *Journal of Research in Personality*, *44*(6), 742–745. doi: 10.1016/j.jrp.2010.10.002

Rohrer, J. M., Egloff, B., & Schmukle, S. C. (2015). Examining the Effects of Birth Order on Personality. *SSRN Electronic Journal*. doi: 10.2139/ssrn.2704310

Stansbury, V. K., & Coll, K. M. (1998). Myers-Briggs Attitude Typology: The Influence of Birth Order with Other Family Variables. *The Family Journal*, *6*(2), 116–122. doi: 10.1177/1066480798062006'

Saroglou, V., & Fiasse, L. (2002). Birth order, personality, and religion: a study among young adults from a three-sibling family. *Personality and Individual Differences*, *35*(1), 19–29. doi: 10.1016/s0191-8869(02)00137-x

Sulloway, F. J. (1996). *Born to rebel: birth order, family dynamics, and creative lives*. London: Abacus.

Wood, E., & Kennison, S. M. (2018). Birth Spacing and Birth Order. *Encyclopedia of Evolutionary Psychological Science*, 1–13. doi: 10.1007/978-3-319-16999-6_835-1

Zyrianova, N., Chertkova, Y., & Pankratova, A. (2013). The Influence of Birth Order and Family Size on the Relationships between Cognitive Abilities and Personality Traits. *Procedia - Social and Behavioral Sciences*, *86*, 262–266. doi: 10.1016/j.sbspro.2013.08.561