

The Influence of Birth Order on Individual Personality: Evidence from Self-Report and Peer Ratings

Frank Zhao, June 2011

Abstract

There have been many publications in the subject of birth order and personality. However, the influence of birth order on personality is still subject to much debate today. This experiment aimed to investigate the validity of Sulloway's predicted scoring of firstborns and lastborns in Big Five personality factors. Participants were asked to complete an online survey that required them to complete an abridged Big Five personality test, both in regards to themselves as well as in regards to their most distant sibling. The results of each survey, self-assessed (n=59) and peer-assessed (n=59), were analysed. Findings suggest that Sulloway's prediction is partially valid, and that birth order only influences personality when observing siblings from within the same family, but not when self-assessing.

Birth Order Theory and the “Big Five” Personality Test

Birth order has been studied by psychologists for over a century, and many studies have yielded interesting results. Defined as the rank of a person's age amongst their siblings, Alfred Adler, first proposed the theory that a person's birth order could have an influence on their personality (Adler, 1964). Adler proposed that firstborns would be “dethroned” by the birth of the next sibling. Firstborns who adapt to the situation try and emulate parents, and tend to become more responsible and achievement orientated (Adler, 1928). Firstborns may place particular attention to the importance of law and order, as Adler suggested, “Sometimes a child who has lost his power, the small kingdom he ruled, understands better than others the importance of power and authority” (Adler, as quoted in Sulloway, 1996). Lastborns who feel inferior to their older siblings may develop self-esteem issues until they decide to compete with their siblings. In addition Adler proposed that, children born with a gap of five years or more between them and their closest sibling became the same as firstborns. By studying the prevalence of birth order theory, insight can be provided into the biological factors of trait theory and its existence in the individual. However, for these hypotheses to be useful, they must be constructed in a way that allows scientific analysis.

Frank Sulloway approaches this problem by fitting the descriptors of Adlerian siblings to the “Big Five” personality dimensions, encompassing traits of extraversion, agreeableness, conscientiousness, neuroticism and openness (Sulloway, 1996). Using the Big Five as a guide, Sulloway translates Adler's hypotheses into quantifiable taxonomies of personality traits. Sulloway predicted that firstborns would score higher in the extraversion, conscientiousness and neuroticism, and lower in the agreeableness and openness descriptors when compared to their younger siblings. Using these behavioural domains, Sulloway conducted a meta-analysis of 196 controlled birth order studies and analysed the degrees of confirmation exhibited to each domain. Although Sulloway's meta-analysis seemed to show the prevalence of birth order effects in individual personality, many respected psychologists have rigorously debated the existence of any trends. In particular, Judith Harris, a critic of Sulloway's work, criticised Sulloway for his lack of evidence supporting his meta-analysis. In a lengthy essay, Harris (2002) criticises Sulloway for his bias in assessing his data, as well as outlining several attempted replications of his study, all have which failed to draw the same conclusion as Sulloway. Since the publication of Schooler's critical review of birth order theory titled “Birth Order Effects: Not here, not now!” (Schooler, 1972), several other reputable researchers have come to the same conclusion that birth order theory is a myth. According to Sulloway (Sulloway, 1996), one noteworthy work is that of Ernst and Angst (1983), in which over a thousand publications on the subject were analysed. Ernst and Angst came to the conclusion that most birth order effects are the result of poorly designed experiments (Ernst & Angst, 1983).

This experiment aimed to investigate the correlation between real world firstborn and lastborn Big Five personality scores to Sulloway's scoring prediction as proposed in *Born to Rebel* (Sulloway, 1996). A sample of firstborns and lastborns aged fourteen to nineteen (n=59) completed a survey consisting of a sample of questions taken from the International Personality Item Pool's (IPIP) sample test for measuring the Big Five factor markers as reported by Goldberg (1992) (IPIP, 2006).

Five questions were given for each factor in the Big Five, totalling twenty-five questions. The participants were then asked to complete another set of twenty-five questions regarding their most distant sibling. This formed the self-assessed and peer-assessed portion of the study, respectively. The hypothesis for this study was that there would be little to no correlation between the results of self-assessed Big Five personality tests and Sulloway's predicted scoring in each of the Big Five domains, however there would be significant correlation between the results of the peer-assessment and Sulloway's predictions.

Method

Design

Twenty-five questions from the IPIP sample test (IPIP, 2006) for measuring Big Five personality factors were published on the survey. The questions were randomised and no information was given about the intention of the study prior to completing the survey. Consent for analysis was asked to be granted in the first question of the survey. In addition, the participants were debriefed and offered an option to discard their results.

Participants

The participants of the survey consisted of anyone who found and completed the survey (n=106). Of these, results of participants who claimed to be an only or middle child were not included in the study (n=21). Results that were falsified or caught by the spam filter were also discarded (n=4). In addition, results of participants whose most distant sibling was under the age of twelve (n=16) and those not within the age bracket of fourteen to nineteen (n=6) were not included. The data selected for subsequent analysis (n=59) were tabulated and analysed.

Procedure

A survey consisting of 25 questions (five questions per category) were extracted from the IPIP 50 question sample test designed for measuring the Big Five factor markers of extraversion, agreeableness, conscientiousness, neuroticism and openness (Appendix A). Participants were asked to determine a rating (1-5) in relation to how well the statement relates to them. On completing the first page of the survey, the participant was asked whether their most distant sibling was twelve years of age. If they answered yes to this question, they were instructed to complete another set of 25 questions in regards to the personality of their sibling (Appendix B). Upon completion, the participants were debriefed and offered an option to discard their results. The survey was hosted on a web server and publicised on various social networks such as Facebook and Twitter and accepted results for two weeks, allowing anyone to participate. After this time, the data was downloaded and analysed.

Results

The data consisted of the self-assessed and peer-assessed results from the personality test undertaken by participants between ages 14-19, and were not an only or middle child. Participants with a gap of five years or more from their most distant sibling were grouped with the firstborn category. Each result consisted of the ratings to each of the Big Five factors, with five sets of questions for each of the factors, comprising of a rating between one and five. In total, the self-assessed results of 59 participants were analysed, as well as 59 peer-assessed results. The self-assessed results were comprised of ratings for 31 firstborns and 28 lastborns, while the peer-assessed results comprised of 19 lastborns and 40 firstborns. These results were sorted into two ordinal groups, firstborn and lastborn and the average score for each ordinal position was calculated, as presented in Chart 1.1 and Chart 1.2. From Chart 1.1, there seems to be little difference between the personalities of firstborns and lastborns when self-assessing their personalities. In each factor of the Big Five, firstborns and lastborns rated themselves similarly. However, Chart 1.2 shows significant difference between the personalities of firstborns and lastborns when personality is peer-assessed. In particular, it shows that firstborns scored higher in the neuroticism, extraversion, conscientiousness, while scoring lower than lastborns in agreeableness and openness. Comparing the averages between self-assessed data and peer-assessed data, a great difference in the intervals can be seen although standard deviation seems to be similar, as shown in Appendix C.

Analysing the 95% confidence intervals for firstborns shows that the results still stand when the data from the sample is applied to the population (Appendix C). Confidence intervals for peer-assessed data encompassed a slightly shifted score bracket when compared to the self-assessed data, even though the distance between the upper and lower values were similar.

Chart 1.1: Average scores for firstborn and lastborn siblings in each Big Five personality factor self-assessed

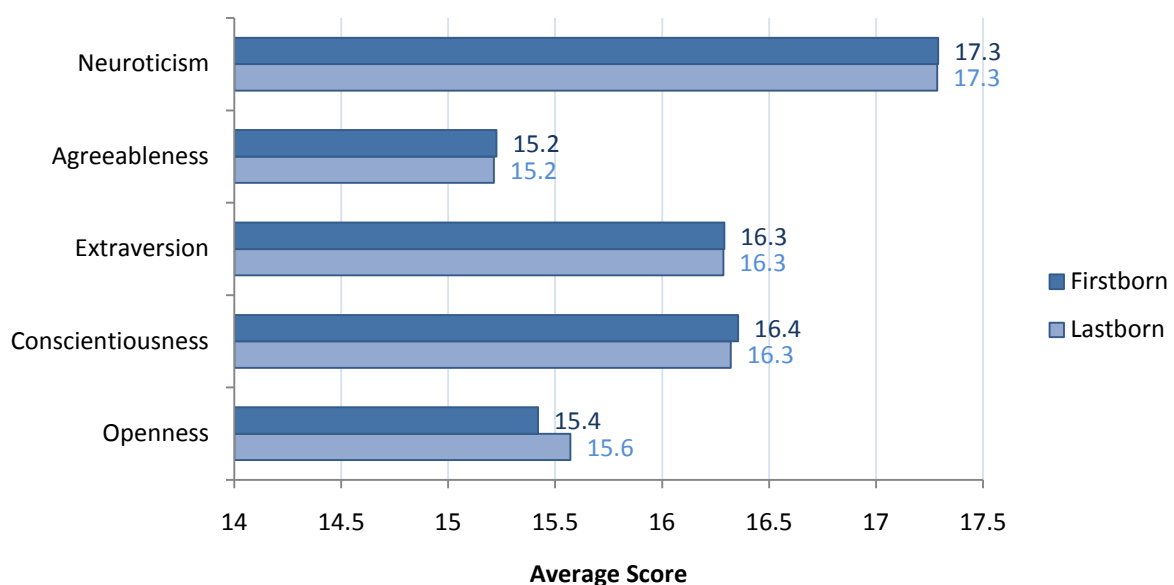
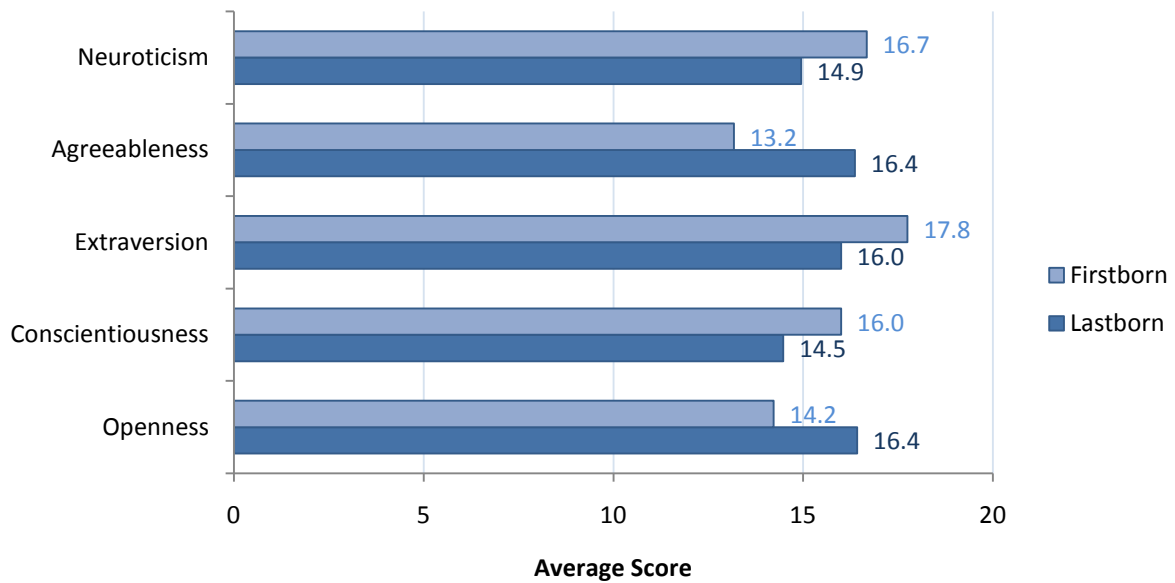


Chart 1.2: Average scores for firstborn and lastborn siblings in each Big Five personality factor peer-assessed



Discussion

By using questions from the IPIP sample test, a standard for personality testing could be followed. Not only does this allow for easier replication of the experiment, but it also allows us to conduct the experiment using widely accepted scales as well as ensuring consistency. Questions were randomised to prevent any bias that may occur. No mention of the purpose of the experiment was evident nor was it suggested, which prevented results influenced by confirmation bias. In the peer-assessment section, children under the age of 12 were not accepted. This is due to the possibility that younger children may not have fully developed personalities. A spam filter was also used, which enabled us to limit survey entries to one entry per person, and also filtered out results that were not realistic. For example, the results submitted by a person who ranked each question with the same value would have been disregarded.

Results of the study provide partial support for Sulloway's prediction on the effects of birth order on personality. The results from self-assessed participants from differing families show indifference between the personalities of firstborns and lastborns. Both groups exhibited similar means in each of the personality descriptors. Although two factors showed support in the hypothesised direction, the magnitudes of these were very small. Consistent with the large majority of past research, self-assessed results seem to show that personality is uninfluenced by birth order and competition within the family. Data from the peer-assessed study, however, seems to show support for Sulloway's hypothesis. Firstborns were found to have scored higher in the areas of extraversion, conscientiousness and neuroticism. Lastborns were found to be perceived as more agreeable and open than their firstborn siblings. The magnitude of this difference was not as large as expected, but nevertheless showed a significant bias to the hypothesised direction.

A similar study conducted by Jefferson (et al.) observed similar results. However they found that when peer-assessed results were extended to spouses, no correlation was found (Jefferson Jr., Herbst,

& McCrae, 1998). As Jefferson (et al.) states, “personality rankings may reflect actual behaviour within the family context, without reflecting styles of thinking, feelings, and behaving outside family relationships”. That is, the perception of a person within the family may not reflect how a person is perceived by non-family members. Sulloway may be correct regarding the seeking of niches within the family context; however this may not apply when taken into other environments. In this study, peer-assessed results were obtained from siblings in the same family. This may have created some bias as to how the siblings were perceived, and is a possible explanation as to why the peer-assessed results corresponded with the hypothesis, while the self-assessed results did not. Future studies should consider conducting peer-assessment not only within the family, but also through friends and acquaintances.

Personality questionnaires are often the best way to determine a person’s personality. However, these tests are generally long and often comprising of 50 questions or more. Participants are often unwilling to complete lengthy surveys, and even if they do, the accuracy of results decrease with increased number of questions. For this reason, only 25 questions were used for each of the surveys (self-assessed and peer assessed) with five questions for each of the Big Five factors. As a consequence, the results may have lacked the additional accuracy that can be gained by using a test-retest situation. Future research could benefit using a test-retest design in experiments, which would be significantly easier than finding participants willing to undertake a lengthy survey.

This experiment aimed to investigate the correlation between real world firstborn and lastborn Big Five personality scores to Sulloway’s scoring prediction as proposed in *Born to Rebel* (Sulloway, 1996). Self-assessed results seem to show no correlation with Sulloway’s hypothesis, but peer-assessed results show a significant correlation to his prediction. Self-assessed results showed that the personalities of firstborns did not differ significantly, while peer-assessed results showed that firstborns scored higher in the extraversion, conscientiousness and neuroticism, and lower in the agreeableness and openness factors in the Big Five personality test. As a whole, the results conform to the study’s hypothesis, but are only partially supportive of Sulloway’s prediction. Findings seem to indicate that birth order only influences personality when observing siblings from within the same family, but not when self-assessing. These results can be relevant to studies on peer influence, as well as to studies on inherent personalities. However, a larger study encompassing a broad range of peers that also utilises a test-retest design would be beneficial to future studies of this subject.

Works Cited

- Adler, A. (1928). Characteristics of the first, second and third child. In A. Adler, *Children* (pp. 14-52).
- Adler, A. (1964). *The Individual Psychology of Alfred Adler: A Systematic Presentation in Selections from his Writings*. New York: Harper and Row.
- Ernst, C., & Angst, J. (1983). *Birth Order: Its Influence on Personality*. New York: Springer-Verlag.
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment* (4), pp. 26-40.
- Harris, J. R. (2002, May 22). The Mystery of Born to Rebel: Sulloway's Re-Analysis of Old Birth Order Data.
- IPIP. (2006). *Possible Questionnaire Format for Administering the 50-Item Set of IPIP Big-Five Factor Markers*. Retrieved June 5, 2011, from International Personality Item Pool: A Scientific Collaboratory for the Development of Advanced Measures of Personality Traits and Other Individual Differences: <http://ipip.ori.org/>
- Jefferson Jr., T., Herbst, J. H., & McCrae, R. R. (1998). Associations between Birth Order and Personality Traits: Evidence from Self-Reports and Observer Ratings. *Journal of Research in Personality*, 498-509.
- Schooler, C. (1972). Birth order effects: Not here, not now! *Psychological Bulletin* (78), 161-175.
- Sulloway, F. J. (1996). *Born to Rebel*. New York: Pantheon Books.

Appendix A: Sample of self-assessed survey

Help me get some data

Please answer the following questions honestly. Your results will be kept in anonymity and with the strictest confidentiality. Please note that that if you are a middle child, then you are not eligible for this study.

* Required

Part 1

Do you consent for your results to be retained for scientific analysis? *

- Yes
 No

Do you have a Y chromosome? *

If you were male at birth, please select 'Yes'.

- Yes
 No

Are you the eldest child or the youngest child? *

- Eldest
 Youngest

What is the year gap between yourself and the eldest/youngest sibling? *

If you were twins or are an only child, please type '0'.

What is your year of birth? *

I often have excellent ideas. *

1 2 3 4 5

Does not apply Applies strongly

I like to use difficult words. *

1 2 3 4 5

Does not apply Applies strongly

Does not apply Applies strongly

Are you an only child, or is your most distant sibling under 12 years of age? *

e.g. If you are the eldest child, your most distant sibling is the youngest child in your family.

- Yes
 No

[Continue »](#)

Appendix B: Sample of peer-assessed survey

Help me get some data

* Required

Part 3

Please answer the following questions by rating how well the statement applies to your most distant sibling.

e.g If you are the eldest child, your most distant sibling is the youngest child in your family.

They find abstract ideas difficult to comprehend. *

1 2 3 4 5

Does not apply Applies strongly

They are very imaginative. *

1 2 3 4 5

Does not apply Applies strongly

They don't often verbally express their ideas, thoughts or emotions. *

1 2 3 4 5

Does not apply Applies strongly

Abstract ideas don't seem to interest them. *

1 2 3 4 5

Does not apply Applies strongly

They often have excellent ideas. *

1 2 3 4 5

Does not apply Applies strongly

They do not empathise with others. *

1 2 3 4 5

Does not apply Applies strongly

They often use difficult words when talking. *

1 2 3 4 5

Appendix C: Means, standard deviations and confidence intervals for individual personality factors

Table 1.1: Averages and standard deviations for firstborns

	Self-assessed		Peer-assessed	
	\bar{x}	σ	\bar{x}	σ
Openness	15.4194	1.9962	14.2250	3.1418
Conscientiousness	16.3548	3.4501	16.0000	3.2026
Extraversion	16.2903	2.0687	17.7500	3.0530
Agreeableness	15.2258	2.0283	13.1750	3.1041
Neuroticism	17.2903	3.1219	16.6750	2.9905

Table 1.2: Averages and standard deviations for lastborns

	Self-assessed		Peer-assessed	
	\bar{x}	σ	\bar{x}	σ
Openness	15.5714	1.9894	16.4211	2.8150
Conscientiousness	16.3214	3.3671	14.4737	2.6950
Extraversion	16.2857	2.2087	16.0000	3.0185
Agreeableness	15.2143	3.0715	16.3684	2.5649
Neuroticism	17.2857	3.1253	14.9474	2.6972

Table 1.3: 95% Confidence intervals for firstborns

	Self-assessed		Peer-assessed	
	Lower	Upper	Lower	Upper
Openness	14.6948	16.1440	13.2210	15.2290
Conscientiousness	15.1025	17.6072	14.9766	17.0234
Extraversion	15.5394	17.0412	16.7744	18.7256
Agreeableness	14.4896	15.9620	12.1831	14.1669
Neuroticism	16.1571	18.4235	15.7194	17.6306

Table 1.4: 95% Confidence intervals for lastborns

	Self-assessed		Peer-assessed	
	Lower	Upper	Lower	Upper
Openness	14.8015	16.3414	15.0694	17.7727
Conscientiousness	15.0182	17.6246	13.1796	15.7677
Extraversion	15.4309	17.1406	14.5506	17.4494
Agreeableness	14.0255	16.4030	15.1368	17.6000
Neuroticism	16.0761	18.4953	13.6523	16.2425

Appendix D: Raw Data (self-assessed)

Are you the eldest child or the youngest?	Do you have a Y chromosome?	Year gap between yourself and the eldest/youngest sibling.	What is your year of birth?	I have difficulty understanding abstract ideas.	I have a vivid imagination.	I am not interested in abstract ideas.	I often have excellent ideas.	I like to use difficult words.	I am always prepared.	I often leave my belongings around.	I pay attention to details.	I often make a mess of things.	I like to get tasks completed quickly.	I would describe myself as socially active.	I don't find myself talking a lot.	I feel at ease when around others.	I often find myself having very little to say.	I seek to start conversations with various people.	I find it difficult to empathize with others.	I am interested in people.	I often find myself insulting people.	I find it easy to sympathize with other's feelings.	Other people's problems do not interest me.	I get stressed easily.	Most of the time I would describe myself as relaxed.	I often find myself worrying about things.	My attention is easily drawn to other things.	I get upset easily.	
Youngest	No	10	1993	2	3	2	3	4	1	3	3	5	3	4	2	4	3	4	2	4	2	4	2	4	5	3	4	1	
Eldest	No	8	1992	4	2	4	2	2	3	2	5	5	2	2	4	3	4	2	1	5	1	5	1	4	2	4	5	5	
Youngest	Yes	3	1994	5	4	3	2	3	3	2	5	2	3	5	3	4	2	1	3	2	3	2	5	2	4	2	2		
Youngest	Yes	4	1994	2	3	4	2	3	3	5	5	4	3	3	4	3	4	3	1	3	4	5	3	4	3	5	4	5	
Eldest	No	2	1994	2	4	2	4	3	4	2	3	1	1	4	1	4	1	3	1	3	3	5	3	2	4	2	4	2	
Youngest	Yes	1	1993	3	3	3	4	3	3	3	5	4	4	3	3	4	2	3	5	4	2	3	2	2	5	3	5	5	
Youngest	Yes	6	1993	2	4	1	4	2	3	3	3	3	3	3	3	2	3	1	4	2	5	1	5	2	5	2	4	4	
Youngest	Yes	2	1993	1	4	1	5	5	2	2	5	1	1	3	4	4	2	2	2	2	2	2	2	4	2	3	3	4	
Youngest	No	2	1993	3	1	4	4	1	4	4	4	5	4	2	4	3	4	2	5	1	2	3	3	2	4	4	5	5	
Eldest	Yes	2	1993	4	5	3	4	2	1	3	2	3	2	4	3	3	4	3	4	4	4	3	5	4	4	4	4	2	
Eldest	No	5	1993	2	4	2	3	3	4	1	4	2	4	4	4	3	3	2	4	3	5	2	4	2	5	2	3	3	
Eldest	Yes	7	1994	3	4	3	2	2	2	4	2	4	2	2	4	2	5	1	2	4	4	5	2	4	2	5	5	2	
Youngest	Yes	3	1993	1	4	3	5	4	2	2	5	2	2	2	4	3	3	3	1	4	2	5	1	2	5	5	4	4	
Youngest	No	4	1993	5	2	3	5	2	4	1	4	2	1	4	2	2	3	3	1	2	4	3	2	5	3	4	5	5	
Youngest	No	1	1993	4	2	3	2	4	1	5	3	1	2	4	2	3	2	4	1	1	3	5	1	3	1	5	5	5	
Youngest	No	3	1994	4	1	5	5	1	2	2	1	2	5	1	4	5	4	1	3	3	2	2	2	4	2	4	5	4	
Youngest	No	4	1991	2	4	2	2	4	5	3	2	2	5	2	4	3	4	2	5	1	5	4	4	2	4	4	5	5	
Youngest	No	3	1994	4	3	5	2	4	4	2	5	4	5	4	3	2	5	2	4	2	3	4	2	1	5	4	4	4	
Eldest	Yes	3	1993	2	3	2	2	4	2	4	5	4	4	4	2	5	3	4	1	5	2	5	1	4	3	5	5	4	
Youngest	No	7	1997	1	4	1	3	4	2	5	3	3	2	4	2	4	3	4	1	5	2	4	2	4	3	4	4	2	
Youngest	Yes	4	1992	4	2	3	5	2	3	5	4	2	3	4	4	5	3	2	2	2	4	4	2	2	2	2	2	1	
Youngest	Yes	3	1993	4	1	5	3	1	2	4	5	5	4	5	4	3	2	5	2	1	2	2	2	4	2	5	3	4	
Youngest	No	3	1993	4	4	4	5	3	5	4	5	4	5	3	2	3	2	3	2	4	4	2	3	4	4	3	5	4	
Eldest	No	3	1993	2	4	2	4	1	4	1	4	2	3	4	4	3	4	3	3	3	3	4	4	4	4	4	3	4	4
Youngest	Yes	4	1993	3	2	3	4	2	1	3	2	2	4	5	3	2	4	4	5	1	3	2	1	4	4	4	5	4	
Youngest	No	1	1993	4	1	5	3	2	3	3	4	5	5	4	1	3	2	3	2	2	4	2	4	3	4	5	4	5	
Eldest	Yes	3	1994	2	5	2	4	4	3	4	3	2	4	4	2	4	2	4	1	2	4	1	3	4	3	4	3	2	
Youngest	No	2	1993	3	2	4	3	2	3	1	3	5	2	4	4	5	5	1	4	5	1	4	5	4	3	3	2	2	
Eldest	No	8	1994	2	4	5	3	4	4	1	4	2	4	3	3	3	5	1	4	2	4	2	5	2	5	2	5	5	
Youngest	Yes	7	1994	3	4	3	5	4	5	4	5	2	5	4	1	5	1	4	1	4	5	2	4	1	2	1	4	1	
Youngest	Yes	6	1993	2	3	2	4	5	3	5	5	4	2	5	2	4	4	3	3	4	3	3	3	3	2	3	2	3	
Eldest	No	3	1993	4	3	2	4	2	3	5	4	3	4	4	1	4	5	3	2	5	4	5	2	4	4	4	4	2	
Eldest	No	7	1993	2	4	3	4	4	3	4	5	3	5	2	5	3	5	2	1	3	2	5	2	5	2	4	4	4	
Eldest	Yes	4	1993	2	3	2	5	5	3	2	5	3	4	4	3	3	4	2	2	4	4	4	1	5	4	4	5	2	
Youngest	No	2	1994	4	2	4	3	2	5	1	3	3	3	3	4	4	2	4	2	4	2	4	4	4	3	4	2	3	
Eldest	Yes	14	1994	3	4	3	5	3	3	3	4	3	3	4	2	5	3	4	2	4	2	4	3	2	3	3	2	2	
Youngest	Yes	10	1993	3	3	4	5	2	1	5	3	3	2	5	3	5	4	3	5	5	4	3	3	5	1	3	4	4	
Youngest	Yes	2	1992	4	3	4	4	2	4	1	4	4	5	5	4	3	4	4	2	3	2	3	5	4	2	3	2	3	
Eldest	Yes	2	1993	3	4	3	4	2	2	1	5	2	2	4	4	2	5	4	2	5	4	4	1	5	5	4	5	3	
Youngest	No	1	1993	4	2	4	3	1	2	4	1	5	3	2	2	3	2	4	2	4	5	4	2	3	2	1	4	4	
Youngest	Yes	2	1993	3	5	4	4	2	3	1	5	4	4	5	4	2	3	4	4	2	5	2	5	4	2	4	4	4	
Eldest	No	12	1994	2	5	1	4	3	3	4	4	3	5	3	5	2	4	3	2	3	1	3	5	2	5	4	3	3	
Eldest	No	4	1992	3	4	4	4	5	4	2	4	3	5	2	5	2	4	1	2	4	2	5	2	4	4	5	5	4	
Youngest	Yes	2	1993	4	3	4	2	3	4	2	4	4	2	3	5	3	3	4	4	2	4	2	3	5	2	3	4	5	
Eldest	No	13	1994	3	3	3	3	4	2	4	2	4	2	4	2	4	2	4	3	3	2	5	2	4	2	4	4	4	
Eldest	No	6	1993	1	5	1	4	5	4	5	5	5	3	5	1	5	2	5	2	5	4	3	4	5	3	5	4	3	
Youngest	No	3	1993	2	4	2	3	2	2	4	4	3	2	3	2	3	2	3	2	3	2	4	4	2	5	5	4	4	
Youngest	Yes	2	1994	2	2	3	4	2	3	4	2	5	4	5	2	3	3	5	3	2	5	3	4	3	3	2	2	2	
Youngest	No	3	1994	2	1	5	3	1	1	4	2	1	3	3	3	3	4	3	1	4	4	5	3	3	3	1	4	2	
Eldest	No	1	1993	1	4	2	4	3	5	5	3	3	4	4	1	3	1	4	1	5	2	5	1	5	2	5	3	5	
Youngest	Yes	5	1992	1	5	1	3	5	5	5	5	5	5	3	1	5	1	5	1	5	2	5	1	3	4	2	5	1	
Youngest	No	3	1992	5	3	4	4	3	3	4	2	4	5	4	3	3	4	4	5	5	3	5	5	2	5	4	2	2	
Eldest	Yes	4	1994	4	3	4	3	3	4	1	3	2	5	4	2	4	3	4	2	4	3	3	3	4	4	4	4	2	
Eldest	Yes	6	1993	1	5	1	2	3	3	3	2	3	5	2	5	3	5	4	1	5	5	5	1	2	2	4	1	4	
Eldest	No	6	1993	1	5	1	4	3	2	4	5	4	4	4	4	2	5	4	1	5	2	5	1	5	4	4	2	4	
Eldest	No	6	1993	2	3	4	4	1	3	2	1	1	2	3	2	3	1	2	1	4	4	2	4	1	4	3	3	1	
Youngest	Yes	8	1993	2	3	2	3	4	1	5	3	4	2	3	4	2	4	1	2	3	5	4	2	4	4	4	4	4	
Youngest	Yes	3	1992	5	3	4	3	3	2	5	5	4	4	5	4	3	4	4	2	1	4	4	2	5	3	4	5	4	
Youngest	No	3	1993	3	1	5	5	1	2	4	1	4	4	4	2	3	4	4	4	4	3	4	3	2	3	4	4	4	

Openness

Conscientiousness

Extraversion

Agreeableness

Neuroticism

Appendix E: Raw Data (peer-assessed)

Are you the eldest child or the youngest child?	Do you have a Y chromosome?	Year gap between yourself and the eldest/youngest sibling.	They find abstract ideas difficult to comprehend.	They are very imaginative.	Abstract ideas don't seem to interest them.	They often have excellent ideas.	They often use difficult words when talking.	They are often prepared for different situations.	They often lose belongings, or don't place things back where they belong.	They often pay attention to details.	They often make a mess of things.	They prefer to complete tasks as soon as possible.	They like to get together and socialise with friends regularly.	They are quiet.	They are comfortable around others.	They don't often verbally express their ideas, thoughts or emotions.	They actively seek to start conversations with other people.	They do not empathise with others.	They often find other people interesting.	They tend to offend others.	They often sympathise with others.	The problems of other people do not interest them.	They get stressed easily.	Most of the time, they are quite relaxed.	They often worry about things.	It is hard for them to focus on things.	They tend to get upset easily.	
Eldest	Yes	2	4	4	3	3	2	3	4	4	4	3	3	2	2	3	3	4	4	3	5	5	3	4	4	2	2	
Youngest	Yes	2	1	2	2	3	2	5	4	4	3	4	2	3	3	5	3	3	4	3	4	2	1	4	3	3	4	
Youngest	No	3	2	2	2	3	3	2	2	3	3	1	4	5	2	4	2	1	4	4	4	3	4	5	3	3	4	
Youngest	No	7	2	4	2	2	3	2	5	3	3	3	5	2	5	5	4	2	5	3	4	3	2	4	2	3	1	
Youngest	No	2	2	2	1	1	3	2	3	3	4	4	2	3	3	5	5	1	3	5	5	4	2	4	3	3	2	
Youngest	No	10	5	4	5	5	4	3	3	3	4	1	3	2	4	1	4	2	4	2	5	2	3	3	3	4	3	
Youngest	No	4	4	3	3	2	2	2	4	3	3	1	2	5	5	4	4	3	2	3	3	3	3	1	4	4	5	
Youngest	Yes	3	4	2	4	2	5	2	4	3	3	3	4	4	5	5	4	5	2	2	2	2	4	1	2	4	3	
Youngest	No	3	3	2	4	4	3	3	3	2	3	3	2	2	5	4	3	2	2	4	1	1	5	4	4	3	3	
Eldest	No	7	4	4	5	3	5	4	3	4	4	5	3	4	5	4	3	4	2	2	3	3	4	4	3	3	3	
Youngest	No	2	2	3	4	4	3	3	3	5	5	4	3	4	4	5	4	4	3	3	2	1	4	5	5	4	3	
Eldest	No	3	4	3	3	3	4	3	3	4	3	2	5	4	4	3	4	4	4	5	5	3	4	3	3	5	3	
Youngest	Yes	8	2	4	2	4	4	3	4	3	4	4	4	2	4	4	4	5	4	4	2	3	4	3	2	3	1	
Youngest	Yes	1	2	3	4	3	4	4	3	3	5	5	4	3	5	3	2	2	1	3	1	2	3	2	4	5	5	
Youngest	No	1	2	1	2	2	3	3	3	2	4	3	2	5	1	3	4	3	3	3	2	2	4	3	2	3	5	
Youngest	Yes	4	3	3	4	3	4	2	2	3	2	3	3	5	5	4	3	2	1	1	1	3	4	4	3	2	2	
Youngest	Yes	10	3	4	5	4	3	4	4	4	4	2	5	1	4	2	4	4	4	2	4	3	3	4	2	3	3	
Youngest	Yes	4	3	1	2	2	1	3	2	3	4	3	5	5	4	4	3	1	3	2	2	2	2	4	4	3	3	
Eldest	Yes	2	3	4	3	5	4	2	3	2	2	4	2	5	5	3	4	3	3	2	1	4	1	3	4	3	3	
Eldest	No	3	4	5	4	4	2	2	2	2	1	3	4	1	5	4	4	3	4	2	3	5	2	4	4	4	1	
Youngest	No	3	2	2	1	3	1	3	5	3	2	2	4	5	3	4	5	2	2	3	1	1	3	2	4	4	3	
Eldest	Yes	6	2	2	5	3	1	3	3	4	4	5	2	3	3	4	1	5	3	5	2	5	1	5	5	5	5	
Eldest	No	5	2	4	2	3	3	4	4	3	4	4	4	2	3	3	3	2	3	2	4	2	2	4	3	2	3	
Youngest	Yes	3	3	1	2	3	3	3	4	4	3	2	3	3	2	2	2	1	2	4	4	3	2	5	5	4	4	
Youngest	Yes	7	3	3	4	3	3	4	1	5	1	5	5	3	4	2	4	1	5	1	5	1	5	1	5	3	5	
Youngest	Yes	3	2	4	2	4	3	2	1	2	3	3	5	3	4	2	4	2	4	1	4	3	4	3	3	2	2	
Youngest	No	3	4	4	5	3	3	3	2	2	3	4	3	2	2	4	3	3	2	1	2	2	4	5	4	3	3	
Youngest	Yes	5	2	5	2	2	4	5	1	5	1	3	5	1	3	1	3	1	5	5	2	1	5	1	5	1	5	
Eldest	No	6	2	4	5	4	3	2	3	3	4	3	3	2	2	4	1	3	5	3	4	2	4	5	4	3	4	
Youngest	No	2	3	4	3	3	3	4	5	4	4	3	4	4	4	3	4	2	1	1	3	2	3	5	4	3	3	
Youngest	Yes	6	2	4	2	2	1	2	2	4	3	4	4	1	4	2	2	2	3	5	2	3	1	5	1	3	4	
Eldest	No	8	3	5	1	5	1	3	5	1	5	1	5	2	2	2	1	5	3	1	2	4	4	4	1	5	1	
Eldest	Yes	3	5	4	4	3	2	1	5	5	5	2	5	2	5	2	5	4	5	5	2	4	2	5	2	4	5	
Youngest	No	3	4	2	5	3	2	3	4	2	3	4	5	2	5	4	4	2	4	4	4	2	3	4	3	2	2	
Youngest	Yes	2	2	2	2	3	1	2	4	5	4	4	3	4	4	3	2	1	3	3	2	2	4	5	5	3	3	
Eldest	Yes	4	3	3	3	4	3	2	5	3	4	2	4	3	4	2	3	4	4	2	4	3	3	4	4	4	4	
Eldest	No	6	2	4	3	3	3	1	3	3	2	3	4	3	4	2	3	3	3	4	4	2	3	4	3	2	2	
Youngest	No	1	4	5	3	4	3	2	1	3	3	3	4	2	4	5	1	3	2	2	3	5	4	4	4	3	4	
Youngest	Yes	2	2	3	4	3	2	3	4	4	3	3	5	3	5	4	4	2	2	2	1	1	2	4	4	3	5	
Eldest	No	1	3	5	3	2	4	3	1	2	2	3	3	2	4	4	3	2	4	2	3	3	2	3	3	1	1	
Eldest	Yes	4	1	5	1	4	2	2	4	2	3	1	2	3	5	2	4	3	4	2	3	2	4	2	5	2	2	
Youngest	No	3	2	3	2	1	2	4	4	3	4	3	3	4	3	5	5	4	3	4	1	5	4	3	4	4	4	
Youngest	No	1	4	3	3	4	5	3	4	4	5	5	4	4	3	5	3	4	4	5	4	1	5	4	3	2	2	
Youngest	Yes	2	3	4	2	2	2	1	3	2	2	2	2	3	1	4	4	3	3	3	2	2	1	4	2	3	1	2
Eldest	No	13	3	2	2	3	1	3	3	5	4	4	3	2	3	5	4	3	3	2	2	3	3	2	2	2	3	3
Youngest	No	4	3	2	2	2	3	4	3	5	4	5	3	3	3	4	3	2	2	1	1	3	4	4	5	4	4	
Eldest	Yes	3	3	3	4	3	2	3	5	2	3	2	5	1	4	3	3	3	3	3	3	3	4	2	3	4	3	
Eldest	Yes	14	2	3	3	4	2	4	3	3	2	2	4	4	3	5	5	3	1	5	3	3	4	2	2	1	2	
Eldest	No	2	2	5	3	5	2	4	1	3	1	2	5	2	4	4	1	3	2	5	2	2	4	2	2	2	2	
Eldest	Yes	7	3	2	1	2	3	4	3	3	2	3	3	2	2	2	3	5	3	3	1	3	3	3	2	4	4	
Youngest	Yes	3	4	2	3	2	3	4	4	5	5	4	4	4	3	4	5	3	2	2	2	3	2	1	4	4	4	
Eldest	No	4	2	3	2	2	4	2	3	2	1	2	2	2	2	2	4	5	2	3	4	2	2	1	3	2	2	
Eldest	No	8	2	3	3	3	2	2	3	4	3	3	4	4	3	2	3	4	3	3	2	4	5	4	4	3	5	
Eldest	No	6	3	3	4	2	3	2	4	4	3	2	4	5	5	4	1	2	2	3	2	5	3	2	2	3	5	
Youngest	Yes	6	5	3	5	3	3	1	4	2	5	2	1	3	2	1	4	5	2	5	1	5	4	2	4	4	4	
Youngest	No	3	4	4	2	3	3	2	3	3	2	2	5	3	3	5	3	4	3	2	2	2	1	4	3	4	5	
Youngest	Yes	2	4	2	5	2	3	5	4	3	4	2	5	1	5	1	5	2	3	3	2	4	3	4	2	3	1	
Eldest	No	12	3	4	3	4	5	3	4	5	3	4	4	3	3	4	1	3	2	2	1	3	2	2	1	3	3	
Youngest	Yes	4	2	4	2	3	3	1	3	3	2	3	5	4	4	3	4	2	2	2	1	3	3	5	5	4	4	

Openness
Conscientiousness
Extraversion
Agreeableness
Neuroticism