



An investigation examining the influence of birth order and received parenting style on the personality of individuals

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### **ABSTRACT**

The present study aimed to investigate whether birth order (first-born, later-born and only-child) or parenting style (Authoritative, Authoritarian, Permissive and Neglectful) had an influence on the 'Big Five' personality traits (Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness). An opportunity sample of seventy-two participants aged between eighteen and sixty-five was used and data were collected using an online questionnaire. Data concerning birth order and personality were analysed using a one-way analysis of variance (ANOVA) for each of the 'Big Five' personality traits and indicated no significant effect of birth order on any of the personality domains. Regarding the effect of parenting style on personality, data were analysed using a 2x2 independent ANOVA for each of the 'Big Five' personality traits and indicated that parenting style does have an effect on two of the 'Big Five' personality traits, Openness and Neuroticism. However, findings of the present study showed some inconsistencies with existing literature. The reasons why this may have occurred, together with possible implications and suggestions for future research are discussed.

<b>KEY WORDS:</b>	<b>PERSONALITY</b>	<b>THE BIG FIVE</b>	<b>BIRTH ORDER</b>	<b>PARENTING STYLE</b>	<b>INDIVIDUAL DIFFERENCES</b>
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## **Introduction**

### **Personality**

Personality refers to an individual's distinctive character (Oxford Dictionary, 2015) and can be described as a collection of relatively stable traits, features or tendencies (Edobor and Ekechukwu, 2015). The American Psychological Association, APA (2015) defines personality as individual differences in patterns of thinking, behaving and feeling. The study of personality includes understanding how a combination of distinctive characteristics or qualities are composed as a whole to form a unique character (APA, 2015).

Personality can be described along five dimensions, Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness to Experience, also referred to as the 'Big Five' (McCrae and Costa, 1992; McCrae and John, 1992). The personality trait of Extraversion refers to an individual's predisposition to seek stimulation and experience positive emotional states (McCrae and Costa, 1992; McCrae and John, 1992). Individuals high in Extraversion tend to be talkative, assertive, enthusiastic, outgoing and enjoy the company of others (McCrae and Costa, 1992; McCrae and John, 1992). The personality trait of Agreeableness refers to the tendency to be sympathetic, kind, warm, considerate and cooperative towards others (John, 1989; Thompson, 2008). The personality trait of Neuroticism refers to an individual's emotional stability and impulse control (McCrae and Costa, 1992; Thompson, 2008). Individuals who score high in Neuroticism are more likely to be sensitive to stressors such as negative emotional states including anxiety, anger and depression (McCrae and John, 1992; Matthews, Deary and Whiteman, 2003). Individuals tend to feel insecure, distressed and have a negative perception of themselves and the world around them (Thompson, 2008). The personality trait of Conscientiousness refers to planning, dependability, organisation, carefulness, deliberation and thoroughness (McCrae and John, 1992; Watson and Clark, 1997; Matthews, Deary and Whiteman, 2003). Those who are conscientious tend to be efficient, organised, self-disciplined, aim for achievement and are hard-working (Watson and Clark, 1997; Matthews, Deary and Whiteman, 2003). The personality trait of Openness to experience can be described as an individual's attentiveness to inner feelings, creativity, preference for variety, active imagination, awareness of beauty and intellectual curiosity (John, 1989; McCrae and Costa, 1992).

There are many factors, internal and external such as genetics and culture respectively, that may influence an individual's personality. However, this discussion will focus on the socialisation of individuals within families. More specifically, research relating to birth order, parenting style and personality.

### **Birth order and personality**

In terms of birth order, when considering the 'Big Five' personality traits, Sulloway (2001; 1999; 1996) proposes that first-born individuals tend to be more neurotic and conscientious and less agreeable and open to new ideas compared to later-born

individuals. In regards to Extraversion, first-born individuals are often more extraverted in terms of being dominant and assertive, whereas later-born individuals are more extraverted in terms of being fun-loving and sociable. Additionally, first-born individuals have a tendency to identify with their parents and become more respectful of authority whereas later-born individuals have a tendency to be more rebellious (Sulloway, 1996).

Sulloway's (1996) theory is supported by Paulhus, Trapnell and Chen's (1999) study. Results showed that first-born individuals were selected as being the most achieving and conscientious. Whereas later-born individuals were selected as being the most rebellious and agreeable. However, Harris (2000) argues that results from 'all-in-the-family' studies such as Paulhus, Trapnell and Chen (1999) do not resemble the world outside the family. Therefore, suggesting that birth order effects on personality may only exist within a family context and do not export to behaviour outside of the home environment (Harris, 1998; Bleske-Rechek and Kelley, 2014). For instance, first-born individuals may well be dominant over their younger siblings however, the benefit of being dominant over their younger sibling within a family context may not transfer into a benefit on the playground with peers (Bleske-Rechek and Kelley, 2014). Therefore, it is important to keep in mind that even if sibling dynamics have an effect on personality, it may only relate to the family rearing environment and may not necessarily relate across all environmental contexts.

Though research from Sulloway (1996) and Paulhus, Trapnell and Chen (1999) has contributed to the understanding of the effects of birth order on personality and has provided evidence regarding which characteristics and qualities correspond to given sibling positions in the family, they have used between-family designs to study the birth order effects on personality. This means examining the effect of birth order positioning by comparing individuals from different families to each other. It could be argued that using between-family designs may not give a true outlook on personality differences between siblings within the same family and that an appropriate test of birth order involves using a within-family design where first-born – later-born comparisons come from within the same family (Healey and Ellis, 2007). Recent research from Bleske-Rechek and Kelley (2014) has utilised a within-family design to study birth order effects on personality by collecting data from first and last-born siblings within the same family. Results demonstrated that there were no within-family effects of birth order on personality and Bleske-Rechek and Kelley (2014) concluded that birth order does not have enduring effects on personality.

### **Parenting style and personality**

In terms of child-rearing, Baumrind (1967) identified four parenting styles, Authoritative parenting, Authoritarian parenting, Permissive parenting and Neglectful parenting. Expanding on Baumrind's (1967) typology, Maccoby and Martin (1983) suggested that parenting styles consist of two dimensions, demandingness and responsiveness. In this framework, demandingness refers to the disciplinary efforts, supervision, maturity

demands and extent of control parents have on their child's behaviour, and responsiveness refers to the amount and the way in which love, affective warmth, involvement and the acceptance of their child's point of view in situations, is expressed to the child by their parents (Goldstein and Naglieri, 2011; Baumrind, 1991; Maccoby and Martin, 1983).

Authoritative parents are high in both demandingness and responsiveness, thus controlling but not restrictive, by taking a child-centred approach (Maccoby and Martin, 1983). They have high expectations of maturity and tend to be forgiving with any failures (Berger, 2011). Misbehaviours are not punished but instead consequences for the child's actions are discussed allowing the child to understand why their behaviour was inappropriate (Santrock, 2007). Authoritative parents encourage independence, allowing their child to explore and make their own decisions whilst still placing limitations on their actions (Santrock, 2007; Ginsburg and Bronstein, 1993).

Authoritarian parents are high in demandingness but low in responsiveness. Authoritarian parenting involves strict control with the discouragement of any open communication, thus taking an adult-centred approach (Maccoby and Martin, 1983; Pulkkinen, 1982). They are restrictive and expect their child to follow their directions even with little or no explanation (Santrock, 2007).

Permissive parents are low in demandingness and high in responsiveness thus taking a child-centred approach. Permissive parents try to become their child's 'friend' by being warm and accepting of their child's actions (Baumrind, 1989), thus allowing their child to behave autonomously without the requirement of mature behaviour (Baumrind, 1991).

Neglectful parents are low in both demandingness and responsiveness (Aunola, Stattin and Nurmi, 2000). They do not support, encourage, monitor or oversee their child's behaviour and tend to be completely uninvolved in their child's life (Baumrind 1991; Maccoby and Martin, 1983).

Existing research from Weiss and Schwarz (1966) investigated the relationship between parenting styles and adolescents' personality in 178 students from the University of Connecticut. A significant main effect for parenting style in relation to Agreeableness, Openness and Neuroticism was found. Those who experienced unengaged (Neglectful) parenting scored extremely low on Agreeableness and Openness. Those who experienced authoritarian-directive (Authoritarian) parenting also scored poorly on Agreeableness and Openness to experience, however, scores were less extreme. Results also indicated that adolescents from authoritarian-directive (Authoritarian) families were significantly less open than those from non-directive (Permissive) families and significantly more neurotic than those from democratic (Authoritative) families.

Other research from Maddahi, Javidi and Samadzadeh et al (2012), using 272 Iranian students, explored the relationship between parenting style (Authoritative, Authoritarian, Permissive and Neglectful) and the 'Big Five' personality dimensions. A direct relationship was found between Authoritative parenting and Openness and between Authoritarian parenting and Neuroticism. An inverse relationship was found between Authoritative parenting and Neuroticism and between Authoritarian parenting and Openness. Therefore, findings suggest that individuals who experienced an Authoritative parenting style may have a greater tendency for Openness and a reduced tendency for Neuroticism compared to those who experienced other parenting styles. Also, individuals who experienced an Authoritarian parenting style may have a greater tendency for Neuroticism and a reduced tendency for Openness, than those who experienced other parenting styles.

There is a general consensus amongst research regarding the influence of parenting style on personality. Other research (Lamborn, Mounts and Steinberg et al, 1991; Edobor and Ekechukwu, 2015) together with the research previously cited, are in part, mutually supportive in suggesting that receiving an Authoritative parenting style has the most favourable outcome for an individual, with receiving a Neglectful parenting style having the least.

The similar findings across western cultures (Weiss and Schwartz, 1966) and Iranian cultures (Maddahi, Javidi and Samadzadeh et al, 2012) suggests there is some reliability and validity regarding the effect of parenting styles on personality. However, issues of cultural differences may occur whereby, notwithstanding the minor differences when describing the characteristics forming a particular parenting style (and therefore levels of demandingness and responsiveness), the interpretation of the degree of levels may differ. For example, when considering Authoritative (high in demandingness and high in responsiveness), the interpretation of a high level of responsiveness may vary between individuals from different cultures. It may be that between different cultures, for example, eastern and western, the level of responsiveness displayed by a parent may be perceived as high to an individual from an eastern culture but low to an individual from a western culture. Therefore, the individual from an eastern culture might be considered to have received an Authoritarian (high in demandingness and low in responsiveness) parenting style from a western cultural perspective, but an Authoritative parenting style from an eastern cultural perspective. This would make it difficult to generalise findings from one culture to another as it cannot be assumed that the level of demandingness and responsiveness will be interpreted in the same way.

All the studies mentioned use self-report methods to collect data which has various advantages, in particular, information richness. When assessing the personality or experienced parenting style of individuals, the particular individual knows best their own personality and experiences, thus, using a method such as self-reports allows access to the respondent's personal thoughts, feelings and actions, including those

that may be performed in private. This gives a greater quantity and breadth of information (Robins, Norem and Cheek, 1999). On the other hand, self-report methods have the disadvantage of social desirability bias. Respondents may answer questions in a manner that may be viewed more favourably by others, for example, first-born individuals may say they are dominant and conscientious as they may think that it is the most favourable answer as they are the eldest out of their siblings and therefore should have these characteristics. Doing so may decrease the validity of the study as the personality of the first-born is not being truly assessed (Robins, Fraley and Krueger, 2007).

### **Aims and hypotheses**

Research surrounding birth order is inconsistent and advocates the need for additional research to support or otherwise, the suggestions of an association between birth order and personality. Therefore, the present study aimed to substantiate the influence of birth order on personality when considering the 'Big Five' personality traits and more specifically, to identify which, if any, of the birth order categories had more or less influence on the 'Big Five' personality traits. With regards to parenting style, the present study aimed to explore the effect of parenting style experienced by an individual on their personality and to see whether previous findings regarding this could be supported.

Therefore, on the basis of previous findings, to answer the research question what impact does birth order (first-born, later-born or only-child) and experienced parenting style (Authoritative, Authoritarian, Permissive, Neglectful) have on aspects of an individual's personality (Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness), the following hypotheses were derived and tested:

H1: First-born and only-child individuals will score higher in Neuroticism and Conscientiousness compared to later-born individuals.

H2: Later-born individuals will score higher in Agreeableness and Openness compared to first-born and only-child individuals.

H3: Individuals who experienced an Authoritative parenting style will score higher on Extraversion, Agreeableness, Conscientiousness and Openness compared to the other three parenting styles.

H4: Individuals who experienced Authoritarian or Neglectful parenting will score lower on Agreeableness and Openness and higher on Neuroticism compared to Authoritative and Permissive parenting styles.

H5: Individuals who experienced Permissive or Neglectful parenting will score lower on Conscientiousness compared to Authoritative and Authoritarian parenting styles.



## **Method**

### **Design**

A non-experimental, survey design was used to investigate the independent variables of, birth order (first-born, later-born and only-child) and of parenting style (Authoritative, Authoritarian, Permissive and Neglectful) and their relationship with the dependent variable, personality (Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness).

### **Participants**

An opportunity sample of seventy-two participants was used for this study. Participants were aged from eighteen to sixty-five of which seventeen were male and fifty-five were female. There were twenty-one first-borns, forty-six later-born and five only-child participants.

### **Materials**

An online questionnaire (Appendix 1) was created using 'Qualtrics', an online survey software and a link (Appendix 2) for the questionnaire was made available on the internet for any participants wishing to take part. Potential participants were sent an invitation email (Appendix 3) with a participant information document (Appendix 4) attached. This included information about their participation and the study. A brief (Appendix 5) was presented prior to the questionnaire which included the aim of the study, instructions for completing the questionnaire and reminded participants of their anonymity, confidentiality and their right to withdraw from the study. The researchers contact details (email) was given for any participants wishing to withdraw their responses before the 01/02/16. Regarding gaining informed consent, a sentence which stated "By clicking 'start' you are giving your informed consent to take part in this study." was presented at the end of the brief. A debrief (Appendix 6) was presented at the end of the questionnaire restating the aim of the study, contact details of the researcher and thanked the participant for their participation.

### **Measures**

The questionnaire consisted of 50 items in total. The first four questions addressed the participants' initials (for identification if they wished to withdraw their results), gender, age and ethnicity. The fifth question addressed the birth order of the participant.

The next twenty-five items (Appendix 7) measured the participants' personality in relation to the 'Big Five', with five items for each of the personality domains (Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness). Some of the questions measuring personality were reversed and randomised rather than being grouped together to minimise response sets. Each question measuring personality was a short statement, such as, "I like order" where the participant was required to rate how much they agree with the statement using a five-point Likert scale.

The five points on the response scale were labelled 'Very Inaccurate', 'Moderately Inaccurate', 'Neither Accurate nor Inaccurate', 'Moderately Accurate' and 'Very Accurate'. These twenty-five items were selected out of fifty items measuring the 'Big five' from the International Personality Items Pool (IPIP). It was anticipated that reducing the number of items by half would increase the response rate as the questionnaire would be shorter and therefore less time consuming for participants to complete. Permission for the use of these scales was not required. Regarding the selection of items used, those that mirrored questions or were similar in meaning were eliminated to avoid repetition and participant boredom.

The final twenty items (Appendix 8) measured the parenting style experienced by participants. These items consisted of five items measuring demandingness in relation to the mother, the same five items measuring demandingness in relation to the father, five items measuring responsiveness in relation to the mother and the same five items measuring responsiveness in relation to the father. Each question measuring parenting style was a short statement, such as, "I would describe my mother as a strict parent" where the participant was required to rate how much they agreed with the statement using a four-point Likert scale. The four points on the response scale were labelled as, 'Very unlike my mother', 'Unlike my mother', 'Like my mother' and 'Very like my mother'. These scales were derived from a study conducted by Paulson (1994). Permission for the use of these scales was granted (Appendix 9)

In order to determine whether mothers and fathers used an Authoritative, Authoritarian, Permissive or Neglectful parenting style, responses that had rated either one (very unlike...) or two (unlike...) were classed as 'low' and responses that had rated either three (like...) or four (very like...) were classed as 'high' with respect to demandingness or responsiveness. The most predominant score out of the five questions measuring demandingness, and the most predominant score out of the five questions measuring responsiveness, was used to determine the category of parenting style to accord with Maccoby and Martin's (1983) framework. For example, if the respondent predominately scored one's or two's out of the five questions measuring maternal demandingness, this would indicate that their mother is low in demandingness. If the same respondent predominately scored three's or four's out of the five questions measuring maternal responsiveness, this would indicate that their mother is high in responsiveness and therefore, categorising their mother's parenting style as Permissive (low in demandingness and high in responsiveness).

### **Procedure**

Data were collected using an online questionnaire. The link for the online questionnaire was shared on social networking sites such as Facebook, in addition to being emailed to potential participants and posted to the Manchester Metropolitan University participation pool for undergraduate students to complete.

Upon clicking the link participants were presented with a brief of the study which was displayed prior to the questionnaire. After participants had read the brief they were required to click 'start' if they wished to take part in the study. Participants were then presented with the questionnaire to complete. Lastly, a debrief was presented at the end of the questionnaire which restated the aim of the study, contact details of the researcher and thanked the participant for their participation. Responses were then analysed (Appendix 10) using SPSS.

### **Ethics**

An ethics approval form was completed (Appendix 11) and there were no major ethical considerations. Participants that took part were presented with a brief prior to completing the questionnaire which informed participants of their anonymity, confidentiality and their right to withdraw from the study. An email address was provided in the brief for any participants that wished to withdraw their responses. A statement which said "By clicking 'start' you are giving your informed consent to take part in this study" was presented to gain the participants informed consent. Additionally, participants under the age of sixteen were asked to not complete the questionnaire. Some individuals may have found their relationship with their parents to be a sensitive topic and were therefore warned during the brief that the questionnaire included questions regarding the parenting style they had received. After the completion of the questionnaire, participants were presented with a debrief which provided the contact details of the researcher and were thanked for their participation.

## Results

### Cronbach's Alpha

Cronbach's alpha ( $\alpha$ ) was used to assess the internal consistency of each of the scales used in the present study. Concerning personality measures, the Extraversion subscale consisted of five items ( $\alpha=.73$ ), the Agreeableness subscale consisted of five items ( $\alpha=.43$ ), the Neuroticism subscale consisted of five items ( $\alpha=.77$ ), the Conscientiousness subscale consisted of five items ( $\alpha=.73$ ), and the Openness subscale consisted of five items ( $\alpha=.58$ ). In terms of parenting style, Cronbach's alphas for the five maternal demandingness and five maternal responsiveness items were .47 and .65, respectively. Cronbach's alphas for the five paternal demandingness and five paternal responsiveness items were .48 and .60, respectively.

### Birth order and personality

#### Descriptive statistics

The means of the total scores for each of the personality domains (Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness) were obtained from three independent groups: first-born ( $n=21$ ); later-born ( $n=46$ ) and only-child ( $n=5$ ). Table 1 provides the mean ( $M$ ) and standard deviation ( $SD$ ) relating to each group.

Table 1:

Means and standard deviations for birth order groups and personality domains

	Extraversion		Agreeableness		Neuroticism		Conscientiousness		Openness	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
First-born	16.76	3.90	19.48	2.54	17.48	4.01	19.10	3.27	17.90	3.77
Later-born	15.98	3.83	19.52	2.62	17.39	4.44	17.20	4.28	18.46	2.59
Only-child	19.60	4.16	20.80	2.59	15.80	4.27	19.40	2.61	18.40	2.07

#### Inferential statistics

With regards to the influence of birth order (first-born, later-born and only-child) on personality (Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness), the means of the total scores for each of the personality domains were analysed using a one-way independent analysis of variance (ANOVA) with the independent variable being the participants birth order and dependent variable being the total scores for each of the personality domains. Out of the series of one-way ANOVAs conducted, there were no statistically significant outcomes at the .05 significance level.

The analysis revealed that there was no significant effect of birth order (first-born, later-born and only-child) on Extraversion,  $F(2,69)=2.07$ ,  $p=.14$ , Agreeableness,  $F(2,69)=.58$ ,  $p=.56$ , Neuroticism,  $F(2,69)=.33$ ,  $p=.72$ , Conscientiousness,  $F(2,69)=2.08$ ,  $p=.13$  and Openness,  $F(2,69)=.26$ ,  $p=.78$ . Thus suggesting that the

difference between each of the three birth order groups was non-significant for each of the 'Big Five' personality traits. Therefore, rejecting H1, H2 and H3.

## Parenting style and personality

### Descriptive statistics

The parenting style (Authoritative, Authoritarian, Permissive and Neglectful) participants experienced was measured in terms of demandingness and responsiveness in relation to their mother and father. As previously explained in the method section, the scores obtained for demandingness and responsiveness were organised into four groups; high demandingness, low demandingness, high responsiveness and low responsiveness in respect to the participants' mother and father. The mean of total scores of Extraversion for maternal demandingness (high and low) and maternal responsiveness (high and low) were calculated and are displayed in Table 2.

Table 2:  
Means (*M*) of scores for Extraversion as a function of maternal demandingness and responsiveness

	Demandingness	
	High	Low
	<i>M</i>	<i>M</i>
Responsiveness		
High	16.05	17.27
Low	16.20	15.64

Using Table 2 as an example, the four groups formed by the 2x2 matrix give rise to the four parenting style categories presented in Table 3.

Table 3:  
Categorisation of parenting styles

	Demandingness	
	High	Low
Responsiveness		
High	Authoritative	Permissive
Low	Authoritarian	Neglectful

Therefore, the mean score of Extraversion at high demandingness and high responsiveness ( $M=16.05$ ) can be referred to as the mean score of Extraversion for Authoritative parenting. The mean score of Extraversion at low demandingness and high responsiveness ( $M=17.27$ ) can be referred to as the mean score of Extraversion for Permissive parenting and so forth.

For ease of reference, the mean scores for each of the personality domains as a function of demandingness (high and low) and responsiveness (high and low) were composed and presented in terms of their associated parenting style categories and are displayed in Table 4 and Table 5. Thus, Table 4 and Table 5 show the mean scores for maternal and paternal parenting styles obtained for each of the personality domains, respectively (refer Table 3, categorisation of parenting styles).

Table 4:  
Mean scores for maternal parenting styles and personality domains

	Extraversion	Agreeableness	Neuroticism	Conscientiousness	Openness
	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
Authoritative	16.05	19.55	18.60	17.05	17.60
Authoritarian	16.20	19.00	16.53	19.07	19.00
Permissive	17.27	20.27	17.15	17.96	18.85
Neglectful	15.64	18.91	16.36	17.73	17.27

Table 5:  
Mean scores for paternal parenting styles and personality domains

	Extraversion	Agreeableness	Neuroticism	Conscientiousness	Openness
	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
Authoritative	16.11	19.61	19.17	18.28	18.50
Authoritarian	16.40	19.87	17.33	17.27	18.87
Permissive	18.00	19.86	15.38	18.00	18.52
Neglectful	15.06	19.06	17.67	17.94	17.33

### Inferential statistics

The total scores for each of the personality domains (Extraversion, Agreeableness, Neuroticism, Conscientiousness and Openness) were analysed using a 2 (demandingness, high and low) x 2 (responsiveness, high and low) independent factorial analysis of variance (ANOVA) for maternal parenting style and was repeated for paternal parenting style. Out of the ten 2x2 independent ANOVA tests conducted, two showed statistical significance at the .05 significance level.

### Extraversion

#### Maternal

The analysis revealed no significant main effect of maternal responsiveness for Extraversion,  $F(1,68)=.57$ ,  $p=.45$ . Additionally, the main effect of maternal demandingness was also non-significant,  $F(1,68)=.11$ ,  $p=.74$ . Moreover, the analysis showed no significant interaction between maternal demandingness and maternal responsiveness for Extraversion,  $F(1,68)=.82$ ,  $p=.37$ .

**Paternal**

There was no significant main effect of paternal responsiveness for Extraversion,  $F(1,68)=2.11$ ,  $p=.15$ . There was also no significant main effect of paternal demandingness for Extraversion,  $F(1,68)=.09$ ,  $p=.77$ . The interaction between paternal demandingness and paternal responsiveness was non-significant,  $F(1,68)=3.13$ ,  $p=.08$ .

**Agreeableness****Maternal**

The analysis demonstrated no significant main effect of maternal responsiveness for Agreeableness,  $F(1,68)=2.24$ ,  $p=.14$ . There was no significant main effect of maternal demandingness for Agreeableness,  $F(1,68)=.24$ ,  $p=.62$ . Furthermore, the interaction between maternal demandingness and maternal responsiveness was found to be non-significant,  $F(1,68)=.40$ ,  $p=.53$ .

**Paternal**

No significant main effect of paternal responsiveness was found for Agreeableness,  $F(1,68)=.19$ ,  $p=.66$ . Moreover, there was no significant main effect found for paternal demandingness for Agreeableness  $F(1,68)=.21$ ,  $p=.65$ . There was no significant interaction between paternal demandingness and paternal responsiveness for Agreeableness,  $F(1,68)=.72$ ,  $p=.40$ .

**Neuroticism****Maternal**

There was no significant main effect of maternal responsiveness for Neuroticism,  $F(1,68)=1.82$ ,  $p=.18$ . Additionally, no significant main effect of maternal demandingness for Neuroticism was found,  $F(1,68)=.58$ ,  $p=.45$ . The analysis also showed a non-significant interaction between maternal demandingness and maternal responsiveness for Neuroticism,  $F(1,68)=.36$ ,  $p=.55$ .

**Paternal**

The analysis also revealed no significant main effect of paternal responsiveness for Neuroticism,  $F(1,68)=.05$ ,  $p=.82$ . Moreover, the main effect of paternal demandingness for Neuroticism was non-significant,  $F(1,68)=3.13$ ,  $p=.082$ . However, the analysis showed a significant interaction between paternal demandingness and paternal responsiveness for Neuroticism,  $F(1,68)=4.45$ ,  $p=.04$ . Therefore, suggesting an effect of paternal demandingness on Neuroticism, although this effect is dependent upon the levels of paternal responsiveness.

## Conscientiousness

### Maternal

There was no significant main effect of maternal responsiveness for Conscientiousness,  $F(1,68)=.80$ ,  $p=.37$ . The main effect of maternal demandingness was also non-significant,  $F(1,68)=.05$ ,  $p=.83$ . Additionally, the interaction between maternal demandingness and maternal responsiveness was non-significant,  $F(1,68)=1.28$ ,  $p=.26$ .

### Paternal

The main effect of paternal responsiveness for Conscientiousness was not significant,  $F(1,68)=.31$ ,  $p=.58$ . The analysis also revealed no significant main effect for paternal demandingness,  $F(1,68)=.04$ ,  $p=.84$ . Furthermore, there was no significant interaction between paternal demandingness and paternal responsiveness,  $F(1,68)=.25$ ,  $p=.62$ .

## Openness

### Maternal

The analysis showed that the main effect of maternal responsiveness for Openness was non-significant,  $F(1,68)=.02$ ,  $p=.90$ . Additionally, the main effect of maternal demandingness was also non-significant,  $F(1,68)=.11$ ,  $p=.74$ . However, the analysis showed a significant interaction between maternal demandingness and maternal responsiveness for Openness,  $F(1,68)=4.28$ ,  $p=.04$ . This suggests that there is an effect of maternal demandingness on Openness, although this effect is dependent upon the levels of maternal responsiveness.

### Paternal

There was no significant main effect of paternal responsiveness for Openness found,  $F(1,68)=.35$ ,  $p=.56$ . Moreover, no significant main effect of paternal demandingness for Openness was found,  $F(1,68)=1.18$ ,  $p=.28$ . Lastly, no significant interaction was found between paternal demandingness and paternal responsiveness,  $F(1,68)=1.25$ ,  $p=.27$ .

Overall, the results regarding parenting style do not support the hypotheses and therefore H3, H4 and H5 are rejected.

In relation to the two out of ten significant outcomes concerning parenting style and personality, Figure 1 and Figure 2 graphically illustrate the way in which maternal and paternal demandingness and responsiveness interact in terms of Openness and Neuroticism, respectively. The plots are annotated with their associated parenting style.



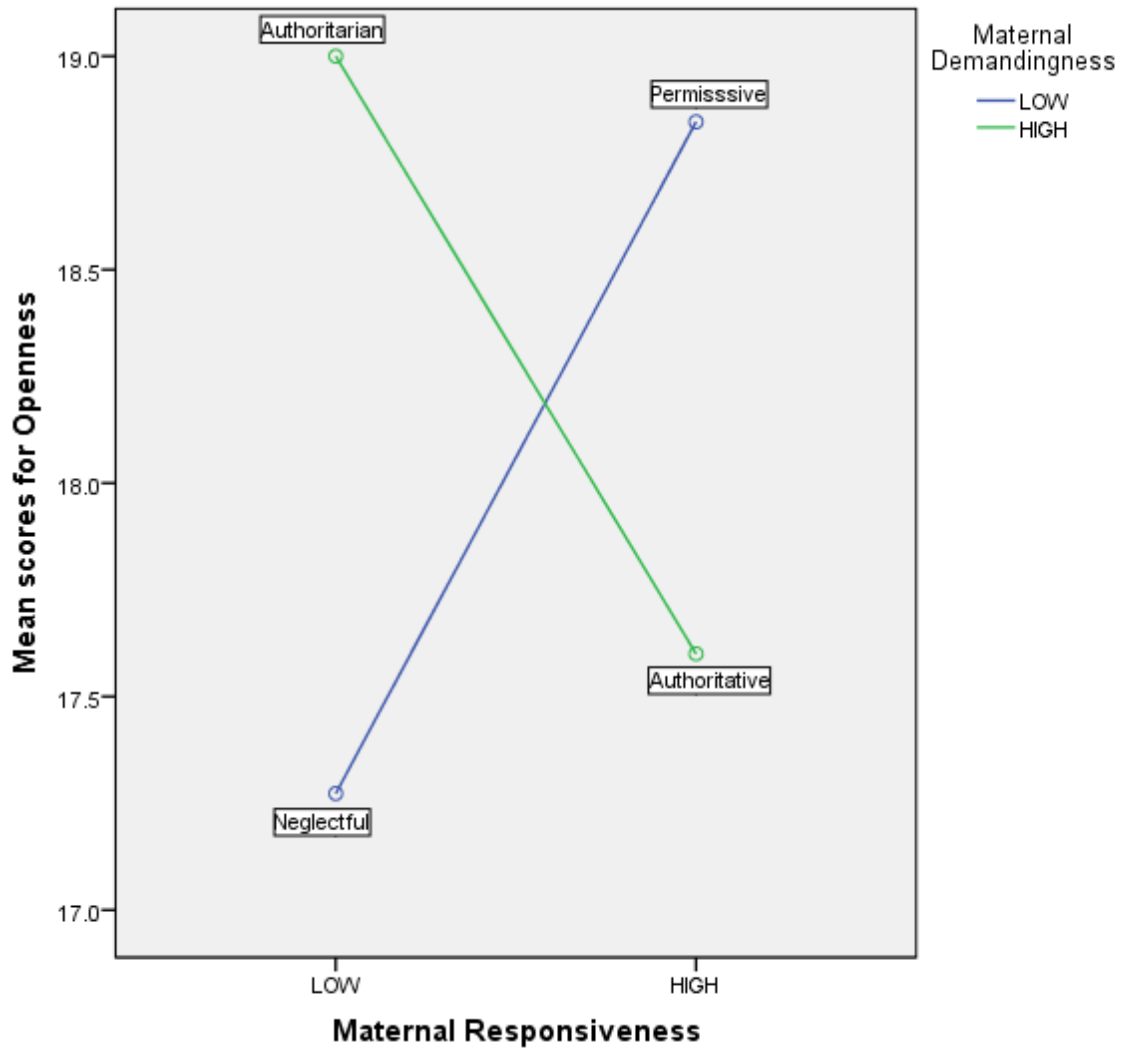


Figure 1: Line plot illustrating the interaction between maternal demandingness and maternal responsiveness for Openness

The line plot in Figure 1 shows that Authoritative parenting (high in demandingness and high in responsiveness) and Neglectful parenting (low in demandingness and low in responsiveness) have a similar mean score for Openness ( $M=17.60$  and  $M=17.27$  respectively) and that Authoritarian parenting (high in demandingness and low in responsiveness) and Permissive parenting (low in demandingness and high in responsiveness) have a similar mean score for Openness ( $M=19.00$  and  $M=18.85$ , respectively). Therefore, showing no main effect for maternal responsiveness, no main effect for maternal demandingness, but a cross-over interaction.

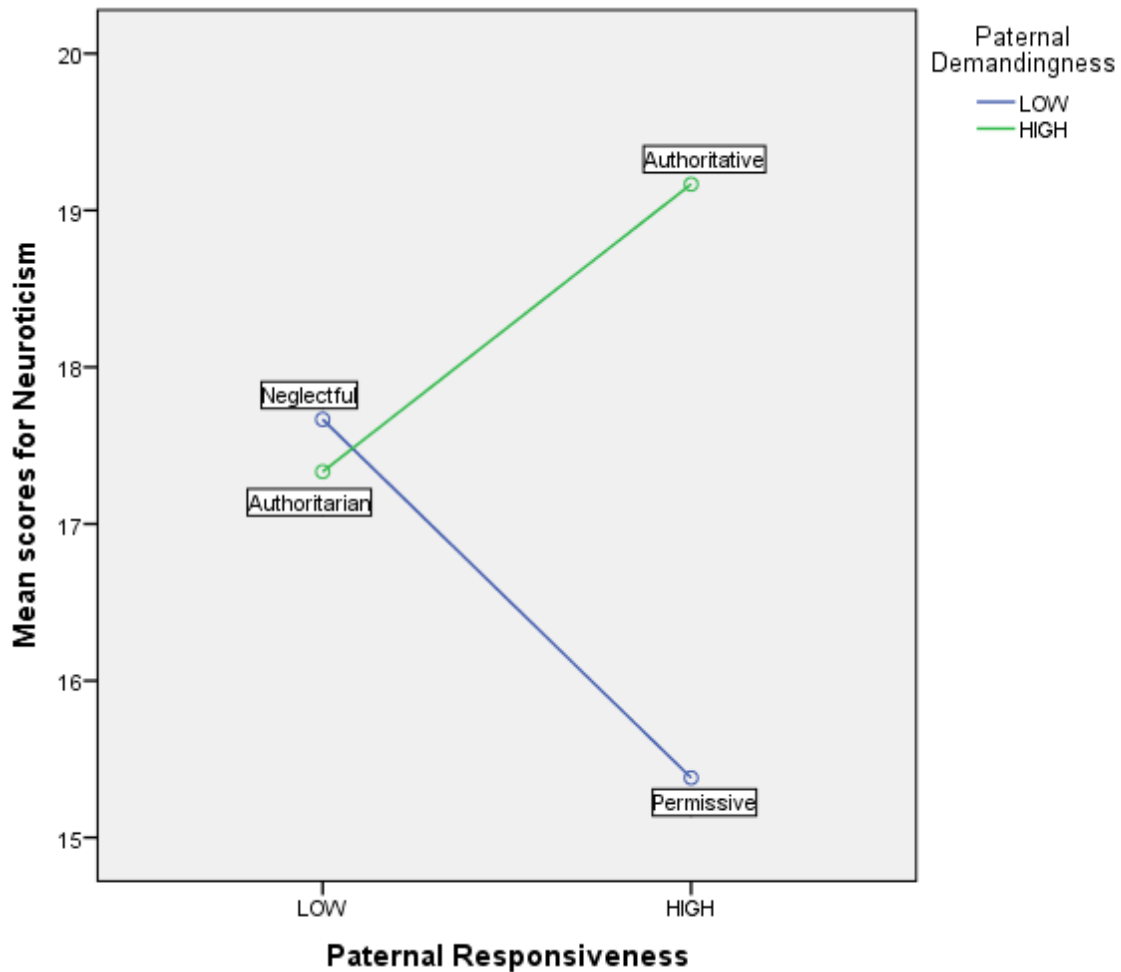


Figure 2: Line plot illustrating the interaction between paternal demandingness and paternal responsiveness for Neuroticism

The line plot in Figure 2 demonstrates that when the level of paternal responsiveness is low (as for Authoritarian parenting and Neglectful parenting) the means for both low and high paternal demandingness are similar for Neuroticism ( $M=17.33$  and  $M=17.67$  respectively). However, when there is a high level of paternal responsiveness (as for Permissive parenting and Authoritative parenting) there is a greater difference between means for low and high paternal demandingness for Neuroticism ( $M=15.38$  and  $M=19.17$ , respectively). This interaction can be seen clearly by the divergence of the lines.

## Discussion

The analyses showed no statistically significant effects of birth order on either of the 'Big Five' personality domains and therefore H1 and H2 are not supported. Furthermore, these findings do not support Sulloway's (1996) theory and Paulhus, Trapnell and Chen's (1999) study however, they were consistent with those from Bleske-Rechek and Kelley (2014).

In terms of parenting style, the analysis revealed a significant interaction between maternal demandingness and maternal responsiveness on scores for Openness. This demonstrated that participants who experienced an Authoritarian parenting style scored the highest on Openness with those who experienced a Permissive scoring slightly less. Additionally, those who experienced a Neglectful parenting style scored the poorest on Openness. To some degree, these findings coincide with those of Weiss and Schwarz (1966) such that those who experienced an Authoritarian parenting style may be more open to experience than those who experienced a Neglectful parenting style. However, in Weiss and Schwarz's (1966) study, Openness scores for those from Authoritarian families were still considered poorer than scores from Authoritative or Permissive families which was not the case in the present study. The analysis also indicated a significant interaction between paternal demandingness and paternal responsiveness on scores for Neuroticism. This showed that those who had experienced an Authoritative parenting style scored the highest for Neuroticism and those who experienced a Permissive parenting style scored the lowest for Neuroticism. These findings oppose those from Maddahi, Javidi and Samadzadeh et al (2012) and to some extent Weiss and Schwarz (1966) as they had suggested individuals who experienced an Authoritative parenting style may have a greater tendency for Openness and a reduced tendency for Neuroticism and individuals who experienced an Authoritarian parenting style may have a greater tendency for Neuroticism and a reduced tendency for Openness, in comparison to the other parenting styles. Regarding the hypotheses in relation to the effect of parenting style on the 'Big Five' personality traits, H3, H4 and H5 were not supported by the present study's findings.

Differences in findings may be due to differences in methodology. Weiss and Schwarz (1966) gathered data from the main participants' mother, father, room-mate and sibling, using more detailed dimensions such as assertiveness control, supportive control, directive/conventional control and intrusive control, measured by a variety of subscales, to construct and define the typology of parenting styles. This collecting of additional data from other sources and using such detailed measures may offer a purer representation of parenting types leading to participants being more accurately categorised based on their received parenting style. This would not only increase the validity but may also affect the potential for differences in means between each group.

Further differences in findings for the current study in terms of being non-significant may be the result of using a smaller sample size ( $N=72$ ) compared to existing research. If sample size is too small, the probability of detecting significant differences between values of birth order groups and of parenting styles for their effect on personality is reduced, hence, lowering the statistical power and increasing the probability of making a type 2 error where incorrectly accepting the null hypothesis leads to a “false negative” (Land and Zheng, 2010). Murphy and Myors (2004) suggest that sample size is the most important determinant of power as statistical power increases with sample size. Although, it could be argued that an extremely large sample size may result in a study being sufficiently sensitive such that any statistical tests might show effects that are significantly different from zero (Land and Zheng, 2010) and therefore increasing the probability of making a type 1 error where incorrectly rejecting the null hypothesis leads to a “false positive” result. Thus, a pilot study could have been conducted in order to counteract issues regarding sample size. Doing so may have also ensured findings came from a representative sample when generalising to the wider population as larger samples more accurately reflect the population it was drawn from.

An interesting note is that when, out of curiosity, further analyses were carried out, using multiple, independent sample t-tests, results revealed that individuals in the only-child birth order group scored ‘significantly’ higher on Extraversion than those in the later-born birth order group, though this difference was ‘borderline significant’,  $t(49)=1.99, p=.05$ . However, conducting several t-tests on the same data set increases the chance of making a type 1 error. Therefore, a Bonferroni correction was performed to counter this. When using the Bonferroni adjusted alpha level of .0167 (.05/3) there was no significant difference between only-child and later-born birth order groups. However, if the original aim of the study was to examine the effect of birth order on the ‘Big Five’ personality traits, using only the two groups of later-born and only-child participants, (and hence the Bonferroni correction would not be needed as only one t-test is being conducted) there would be a ‘significant’ difference between these two groups for the personality trait of Extraversion. This brings to mind the issue of ‘p-hacking’ and possibly, backwards engineering of hypotheses, such that once the analysis reveals any p-value of less than .05, the paper is written with the hypothesis set accordingly (Jump, 2015).

It is a bit like the Texas sharpshooter fallacy, where you spray the wall with a machine gun and then draw the target around where you happened to hit (Jump, 2015:46).

P-hacking may arise due to researchers being under pressure to publish more meaningful findings and therefore being selective in the results reported (Jump, 2015). This is not to suggest in any way whatsoever that p-hacking has occurred vis-à-vis the research cited in this report and no such inference should be taken. One possible reason for the irreproducibility of existing research findings could be that past research

holds publication bias in terms of journal editors or authors of research being more likely to accept or submit positive as opposed to negative results (Sackett, 1979).

Participants in the present study were aged between eighteen and sixty-five. Whilst a diverse age range increases the generalisability of results to a wider age-ranged population, it is important to highlight that in the present study, 67% of participants were aged between eighteen and twenty-two. This therefore reduces the population validity as the sample does not give a true representation of individuals aged between eighteen and sixty-five, thus care should be taken when generalising findings to different age groups.

Due to substantial differences in participant ages the interpretation of actions and the relationship between participants and their parents may vary due to differences in levels of maturity between younger and older participants. For example, an older aged participant, having gained a greater understanding of life and a higher level of maturity (Wechsler, 1950) may now interpret their mother's actions as responsive and caring rather than strict and controlling, thus leading to rate their mother as high in responsiveness for some questions. Whereas the same participant if surveyed at a younger age, having a lower level of maturity, may have disagreed with and interpreted their mother's behaviour as controlling in respect of certain events, thus causing them to respond to some questions rating their mother as high in demandingness. This may have reduced the internal validity of the study as scales concerning parenting style may not have measured the actual parental demandingness and responsiveness felt by the more mature participants at the time but rather a biased interpretation of it. Therefore, it could have been noted that questions regarding parenting style referred to what they experienced during early to middle adolescence (12 to 17 years). Furthermore, participants who based responses on their earlier relationship with their parents whilst growing up, relied heavily on retrospective memory. The use of retrospective memory may have resulted in some participants incorrectly remembering their past experiences leading to erroneous responses. The chance of this may be increased for older participants as age has been shown to be a significant factor effecting memory (Maylor, 1993; Lou and Craik, 2009) and therefore responses may be less reliable.

In terms of birth order, it could be that the conceptualisation of the role that birth order plays in forming personality may be oversimplified, such that birth order is not a determining factor in the development of an individual's personality and that other factors are to be considered. In relation to parenting style, although findings of the present study conflict with those from existing research, they should not be disregarded as they have raised doubts related to the consistency of previous findings. Therefore, it could be considered from the findings that parenting style may not have such an important role on personality as may be inferred from existing research and could perhaps reduce the allocation of blame on parents in adverse cases.

Notwithstanding the apparent inconsistencies, research regarding parenting style would be useful in terms of educating new parents or improving current parenting. By informing parents and providing further knowledge and understanding about the potential effects of parent-child relationships, parents may consider changing or modifying their parenting style in order for their child to achieve the best in life. Moreover, research in this area has clinical implications in terms of adopting the most suitable and effective treatment approach. For example, Uji, Sakamoto and Adachi et al (2014) found Authoritative parenting to have a positive, beneficial impact on their child's later mental health and Authoritarian parenting to have a negative and worsening impact. This highlights the effects that may occur due to differing degrees of parental authority on mental health. Therefore, it is important that clinicians exercise their authority through an Authoritative approach in order for the client to receive the most effective form of treatment (Uji, Sakamoto and Adachi et al, 2014). Moreover, the findings of the present study offer a foundation for future research which could involve more complex associations, for example, a further investigation examining whether parenting style is dependent upon the birth order of an individual or whether it is the child's personality that determines the parenting style. Additionally, further studies involving longitudinal research relating to the effect of birth order and parenting style on personality may offer a greater understanding and clarify inconsistencies in existing research as they could provide a more accurate assessment of family influences on personality.

To summarise, it can be concluded from the present study, that birth order does not have an impact on personality when considering the 'Big Five' personality traits and therefore suggests that birth order may not be a determining factor for personality. It can also be concluded that parenting style does have an impact on two of the 'Big Five' personality traits, Openness and Neuroticism in individuals. Findings of the present study partially agree with existing research. The inconsistencies may be the result of differences in methodology, sample size, participant demographics or publication bias. Nevertheless, research in this area could be beneficial in a clinical context in terms of treatment approaches. For the reasons discussed, continued research is needed in order to revalidate apparent influences of birth order and parenting style vis-à-vis an individual's personality.

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