Birth-order effects on facets of extraversion

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Abstract

The present study investigated the reasons for inconsistent findings concerning birth-order effects and extraversion. According to Sulloway (1995, 1996), one would expect first-born siblings to rate higher on one of the facets, dominance, and later-born siblings to rate higher on the other facet, sociability. In a within-family design, 96 undergraduate and graduate students rated themselves and their siblings on a 12-item extraversion scale taken from the NEO Five-Factor Inventory. One-sample t-tests revealed, as predicted, that first-borns rated significantly higher than later-borns on the facet of dominance and later-borns rated significantly higher on the facet of sociability. Various alternative explanations of the results were ruled out and the contribution of the within-family method to the study of birth-order effects in personality was discussed.

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1. Introduction

The notion that birth-order has a significant effect on individual characteristics is not a new phenomenon. In 1874, Sir Francis Galton (Galton, 1874) suggested that eminent male scientists were far more likely to be first-borns in their families than later-borns (Forer, 1969). Research has shown that first-borns are overrepresented in political office (Hudson, 1990), and there are
birth-order differences in intelligence (Zajonc, 2001) and in the Big Five personality dimensions of extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience (Paulhus, Trapnell, & Chen, 1999; Sulloway, 1996).

Sulloway (1996, 2001) has proposed a family dynamics model of birth-order effects in personality and behaviour, which has several “causal mechanisms”. For example, Sulloway suggests that when parental resources are low, investment is focussed more heavily on one offspring, typically the first-born. Also, Sulloway supposes that first-borns are bigger and stronger than later-borns and use these competitive traits to their advantage. Additional causal mechanisms in the family dynamics model include deidentification, where siblings try to differentiate themselves from one another in terms of interests, social attitudes and personalities, and niche differentiation, where siblings adopt different roles within the family (e.g. “the rebel of the family”), in order to reduce competition (Sulloway, 1996, 2001).

Empirical evidence to support the family dynamics model has mainly come from Sulloway’s (1996) meta-analysis of 196 birth-order studies. As hypothesised, first-born status positively correlated with conscientiousness, neuroticism, and extraversion (specifically assertiveness), and later-born status was positively correlated with agreeableness and openness to experience. Sulloway explained these findings by suggesting that first-borns are more likely to identify with parents and have strong motivation to satisfy parental expectations. Further, first-borns are more assertive and jealous in order to preserve valued parental resources. Later-borns, on the other hand, are more likely to be agreeable in order to reduce any possible threatening confrontations with their older and stronger siblings and are more rebellious/adventurous to facilitate the pursuit of alternative strategies for parental investment.

In line with doubts raised by Ernst and Angst (1983) about the very existence of birth-order effects, several studies have failed to support Sulloway’s (1996) findings. For example, Michalski and Shackelford (2002) surveyed 277 undergraduate students, obtaining demographic information (e.g. age, gender, socioeconomic status and sibling sequence information) and self-ratings on 40 bipolar items designed to assess the Big Five. No relationships were found for conscientiousness, emotional stability or extraversion and a positive relationship (contradictory to Sulloway’s findings) was found between first-born status and agreeableness. Similarly, Jefferson, Herbst, and McCrae (1998) failed to show that birth-order was associated with personality in 9664 participants rating themselves. Skinner (2003) focused on birth-order effects in different facets of dominance, using a between-family design, and was unable to find any significant birth-order differences.

Furthermore, birth-order effects and Sulloway’s evolutionary theoretical standpoint have recently been undermined by the findings of Beer and Horn (2000). Their study of rearing order on adoption cohorts effectively separated effects of biological birth-order from rearing order. The authors reported data from two adoption cohorts in which subjects were biological first-borns reared in various ordinal positions. Between- and within-family analyses showed that rearing order’s influence on personality was extremely weak. However, they did find that there was a significant difference for conscientiousness, where first-reared siblings scored more highly. In contrast, Jefferson et al. (1998) did find results in line with Sulloway’s predictions when friends, neighbours or co-workers rated participants rather than the participants rating themselves. Later-borns were perceived by their peers as being more sociable, innovative and trusting than first-borns. This result was not replicated when spouse ratings of personality were used instead of peers, or on measures of assertiveness, neuroticism or conscientiousness.
Paulhus et al. (1999) argued that studies failing to support Sulloway’s predictions have all used between-family designs, that is, the individuals being compared have been from different families. Between-family birth-order data involve several confounding factors such as parental personality and genetics that are difficult to control for. Using within-family designs (where first-born and later-born comparisons come from within the same family) Paulhus et al. found that first-borns were nominated as most achieving and conscientious and later-borns were nominated as most rebellious, liberal and agreeable. The weakest effect found was for extraversion, a finding that is in line with Sulloway’s original hypotheses. Sulloway (1996) suggested that different component traits, such as sociability and dominance in the case of extraversion, may be differentially associated with birth-order and thus show non-significant results when taken as a unitary construct. Paulhus et al. (1999) used very simple measures for personality assessment (such as “socially confident” for a measure of extraversion), which may have failed to capture the complexity of multifaceted dimensions of personality. Further, the studies involved a “take-home package” where participants rated themselves and siblings while they were at home rather than in a more neutral environment.

The aim of the present study was to investigate the inconsistent findings concerning extraversion, make use of Paulhus et al.’s (1999) more powerful and robust within-family design, and repeat the research outside the family setting. In line with Sulloway’s (1996) predictions, it is hypothesised that there will be a significant difference between first-borns and later-borns on the different facets of extraversion. More specifically, we predicted that first-borns will be rated as more dominant than later-borns and later-borns as more sociable than first-borns.

2. Method

2.1. Participants

Undergraduate and graduate students from University College London completed extraversion and birth-order questionnaires. To avoid the possibility that participants had studied the effects of birth-order psychology students were not included. To be admitted into the final sample participants were required to have a full genetic sibling with an age gap not exceeding nine years. This is in line with previous studies (e.g. Beer & Horn, 2000), which suggest that birth-order effects are negligible when there is a large age gap between siblings. Due to cultural differences found in personality, only people living in the United Kingdom for more than 17 years were included in the final analyses. We dichotomized the birth-order variable into first-borns and later-borns as it simplified our analyses and is the approach most often used by birth-order researchers (e.g. Beer & Horn, 2000; Michalski & Shackelford, 2002; Sulloway, 1996). The final sample consisted of 47 first-borns (20 male and 27 female) and 49 later-borns (25 male and 24 female) with a range of 18–52 years ($M = 21$, $SD = 4.45$).

2.2. Design and procedure

Participants were given a questionnaire pack which included an information sheet. The words “birth-order” were deliberately avoided to reduce the effect of existing stereotypes concerning
birth-order. The within-family design required participants to first rate themselves and all their siblings on two components of extraversion. The order in which they rated themselves and their siblings was counterbalanced to reduce any order effects. Having completed these ratings participants filled in a table that asked for the name, gender and age of their siblings and themselves in order from first-born to last-born. They were asked to circle their own name. Participants (whether first-born or later-born) were compared to one other sibling. In cases where participants were first-borns with more than one sibling, they were compared to the sibling closest to them in age. This was to ensure that the age gap was reduced whenever possible, in line with research that suggests that the larger the age gap between siblings, the less birth-order effects emerge (Sulloway, 1996).

2.3. Materials

The 12-item extraversion scale from the NEO Five-Factor Inventory (Costa & McCrae, 1992) was divided into two clusters: five items concerned with assertiveness, activity, and excitement represented dominance, and seven items concerned with warmth, gregariousness, and positive emotions represented sociability. Each item consists of a 5-point Likert scale ranging from strongly disagree to strongly agree. For data on the instrument’s reliability, factor structure, longitudinal stability, and validity, see Costa and McCrae (1992). The first person scale was rewritten in the third person, retaining the same form of words, for sibling ratings.

3. Results

The age of the siblings (52 males and 44 females) being rated by the 96 participants was 12–51 years ($M = 21$, $SD = 5.98$). The difference in the personality ratings between first-born and later-born siblings was compared to zero using one-sample $t$-tests. This revealed significant effects for both sociability (mean difference = $-1.20$, $SD = 5.86$, $t(95) = -2.00$, $p < 0.05$), and dominance (mean difference = $0.94$, $SD = 4.50$, $t(95) = 2.04$, $p < 0.05$). In line with the hypotheses, later-borns were rated as more sociable than first-borns and first-borns were rated as more dominant than later-borns. The size of the age difference between the participant and their sibling was unrelated to these difference scores, Spearman’s $\rho = -0.01$, $p > 0.05$, for sociability and $\rho = 0.07$, $p > 0.05$, for dominance.

Independent samples $t$-tests showed that there were no significant differences between male and female participants in sociability, $t(94) = 1.89$, $p > 0.05$, or dominance scores, $t(94) = -0.48$, $p > 0.05$.

A post-hoc analysis was conducted to explore whether there was a difference between how people rated themselves and their siblings. Independent samples $t$-tests revealed there was no significant difference for sociability, $t(190) = 0.84$, $p > 0.05$, but that people were more likely to rate themselves rather than their siblings (regardless of birth-order) as more dominant (participants’ mean = 27.44; $SD = 3.68$; siblings’ mean = 25.03; $SD = 4.99$; $t(190) = 3.80$, $p < 0.01$). These findings remained when first-borns and later-borns were taken separately: both groups rated themselves higher on dominance than their siblings, but did not differ on sociability.
4. Discussion

Overall our results support the hypothesis that birth-order affects personality development. More specifically, they are consistent with the findings of Jefferson et al. (1998), whose method involved third person ratings, that the two principal facets of extraversion, sociability and dominance, differ as a function of birth-order. Our finding, using a within-family analysis, that first-borns seem to rate higher in dominance and later-borns seem to rate higher in sociability provides further support for Sulloway’s post-hoc proposal that birth-order effects on extraversion are inconclusive because of its sub-facets, and thus further support his theory of niche-establishment within families. Further, we were able to rule out the influence of various possible confounding factors that can potentially affect the results of within-family studies, including gender and the size of the age difference.

Our data support the claims of Paulhus et al. (1999) that the within-family design is a powerful method of studying birth-order effects that enables sample sizes to be greatly reduced in comparison with between-family designs. This is mainly because it provides a natural control for a number of confounding variables such as sibship size and socioeconomic status. The fact that the use of this method revealed significant findings while a corresponding between-family study that controlled statistically for similar covariates did not (Jefferson et al., 1998) prompts reflection about other possible factors causing the different results. Two such factors could be whether the measure of the personality trait is based on self-report or an observer’s rating, and the degree to which the measure of personality is influenced by the family context.

The present study found effects of first-person versus third-person rating, a possible confound, which may have also presented a threat to internal validity. For sociability there seemed to be no difference between how people tended to rate themselves and their siblings, but for dominance people tended to rate themselves higher than their siblings.

According to Sulloway (1996), observer ratings are superior to self-reports in capturing birth-order effects on personality traits, because self-reports are vulnerable to social desirability. For example, first-borns would tend to underrate their level of dominance. If birth-order was a powerful influence on personality, the failure of self-report inventories to detect it would imply a serious critique of self-report methods.

However, there is substantial evidence indicating that self report inventories measuring the big five personality traits, such as the NEO Five-Factor Inventory, are adequate detectors of comparable effects such as those of culture and gender (McCrae, Yik, Trapnell, Bond, & Paulhus, 1998). Furthermore, this study showed significant differences between how people rated themselves and their siblings on dominance in the opposite direction to that predicted by Sulloway. Thus the idea that findings of significant birth-order effects on extraversion in this study could be accounted for by the fact that observer ratings are less vulnerable to social desirability does not seem plausible.

The discrepancy between self-reports and observer-ratings revealed in this study and other studies of birth-order (e.g. Jefferson et al., 1998) remains unexplained. However, this confound can be diminished considerably by ensuring approximately equal numbers of first-borns and later-borns in the sample as was done in this study. In future research, one way to remove these discrepancies altogether would be to get people (with a sibship size greater than three) to only rate their siblings and then compare within-family ratings of more than one sibling.
One possible implication of our data, like those of Paulhus et al. (1999), is that birth-order effects may be more salient when studied in the context of the family. Even though attempts were made to avoid the influence of birth-order stereotypes, the participant was still asked to rate him- or herself and the siblings at the same time, so some degree of implicit comparison was inevitable. This is not necessarily a weakness of the study per se, but it leads to the more general issue of person–situation interactions (Mischel, 1968): to what degree is the measure of personality traits independent of the context in which they are measured? For example, Jefferson et al.’s (1998) results could also support the notion that birth-order effects may be salient in some situations but not in others. They found predicted personality differences between first-born and later-born siblings when they analyzed third-person ratings by peers. However, when they analysed third-person ratings by spouses they did not succeed in replicating the results, suggesting that perhaps the participants’ character was not constant between peer contexts and marital life contexts. One way to interpret the findings of this study is that the within-family design acts as a magnifying glass and detects birth-order differences that are only minor in the adult’s daily life. In contrast, the between-family design, which is less likely to detect significant birth-order differences, is more representative of life beyond the family. This may indicate that within family studies on birth-order are mainly relevant as a source of information about participants’ developmental years and their ongoing interaction with the family of origin.

Our results do suggest that birth-order affects personality within families, but a limitation of the study is that the results do not show whether this is a function of biological birth-order or rearing order. Hence we cannot draw any definite conclusions about the possible evolutionary aspect of birth-order effects, or the effect of rearing order as they are intrinsically linked within the paradigm of this study. Although birth-order has mainly been considered an environmental variable, and the contextual nature of the effects indicated by the present study support the environmental aspect, it has also been suggested that biological factors associated with birth-order, such as intra-uterine influences (Sokol et al., 1995), may exert an effect on personality traits. A recent adoption cohort study by Beer and Horn (2000) found evidence to support the notion that biological factors may also have an influence in personality differences within sibships, suggesting that it may be beneficial for future research to take possible biological influences on birth-order into account.

The results of this study should not be taken as simply another study amongst thousands in support of one side of the birth-order debate, but should be seen as part of a new breed of birth-order studies, looking at more specific methodologies and contexts in which birth-order effects may be seen. The debate as to whether birth-order has an effect on personality development is by no means over, but hopefully with more researchers who are willing to explore new angles and methods in birth-order research, we will better understand the complex interactions between biological, genetic and psychosocial factors.

References
