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Birth order and personality: A within-family test using independent self-reports from both firstborn and laterborn siblings

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ABSTRACT

Assumptions about the effects of birth order on personality abound in popular culture and self-help books. Indeed, when one sibling is asked to compare themselves to others in their family, birth order shows weak-to-moderate effects on personality (e.g., Healey & Ellis, 2007; Paulhus, Trapnell, & Chen, 1999). No study to date, however, has utilized a complete within-family design that includes independent self-reports from both firstborn and laterborn siblings in the same family. To fill this gap, we collected Big Five personality data on 69 young adult firstborn–laterborn sibling pairs. We also obtained data from parents of the sibling pairs and peer ratings of original participants' personality traits. Within-family analyses revealed that neither siblings' independent self-reported personality traits, nor parents' reports of their children's personality traits, differed systematically as a function of birth order. Our findings are consistent with results from between-family designs and they provide further evidence, employing a within-family design that utilizes data from multiple family members, that birth order does not have enduring effects on personality.

1. Introduction

Interest in the influence of birth order on personality has been strong since at least 1928, when the psychotherapist Alfred Adler introduced a formal theory of birth order and personality among siblings. Beliefs about the power of birth order continue to abound in popular culture and self-help books. To illustrate, an Amazon.com book search on the term "birth order" (February 2013) revealed thousands of hits, with popular titles including, *The birth order book: Why you are the way you are* (Leman, 2009), and *The birth order effect: How to better understand yourself and others* (Isaacson & Radish, 2002). Despite the appeal of these books, empirical research on birth order and personality has consistently revealed only sporadic links between personality and birth order. Moreover, a detailed review of the birth order literature (Ernst & Angst, 1983) attributed findings in favor of a birth order effect to the use of between-family designs. In between-family designs, individuals from different families are compared to each other as a function of their birth order position. Ernst and Angst noted that sibship size (and hence birth order) is correlated with income, IQ, and parenting styles (e.g., see Herrera, Zajonc, Wieczorkowska, & Cichomski, 2003, study 4), and that between-family comparisons of children of different birth orders do not adjust for these effects of family size. When Ernst and Angst (1983) limited their analyses to studies that controlled for effects of family size, birth order effects on personality were negligible.

Scholarly analyses of the effects of birth order on personality were reinvigorated by the release of the academic book, *Born to rebel* (Sulloway, 1996). Sulloway proposed that firstborn children have much to gain from following the status quo and hence should be conscientious and rule-bound; laterborn children, in their unconscious inclination to obtain others' investment by distinguishing themselves, should be more agreeable and unconventional (open). Consistent with Ernst and Angst's (1983) argument, between-family designs that compared firstborns and laterborns have failed to systematically document the birth order effects predicted by Sulloway's model, even with large samples (Dunkel, Harbke, & Papini, 2009; Jefferson, Herbst, & McCrae, 1998; Marini & Kurtz, 2011; Parker, 1998; Pollet, Dijkstra, Barelds, & Buunk, 2010). Indeed, research regarding nonshared environmental influences on children's personality development has revealed few significant forces besides differential peer and teacher interactions (Harris, 1998; Turkheimer & Waldron, 2000). However, various researchers (Healey & Ellis, 2007; Paulhus, Trapnell, & Chen, 1999) have argued that the appropriate test of birth order is within-family, in that the firstborn–laterborn comparisons should come from within the same family. As reviewed by Sulloway (2011) in a meta-analytic summary of studies conducted by six teams of researchers, when adults are asked to list their siblings and then compare themselves

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against their siblings on various personality traits, firstborns are judged as more achieving and conscientious, and laterborns are judged as more rebellious and open. For example, Healey and Ellis (2007) found moderate effects (Cohen's *d* values ranging from .11 to 1.03) of birth order on conscientiousness and openness in two separate samples, even with small subsets of siblings; Paulhus, Trapnell, and Chen (1999) documented weak-to-moderate effects (Phi's ranging from .10 to .30) of birth order on conscientiousness and rebelliousness in four separate samples. Thus, within-family designs suggest weak-to-moderate effects (Cohen's *d* values ranging from .2 to .5) of birth order on personality. (One of the remaining studies Sulloway (2011) cites is from an unpublished honor's thesis (Chao, 2001) and thus we were unable to obtain it for review. Another study (Rohde et al., 2003) actually provides *between*-family comparisons of firstborns' and laterborns' likelihood of nominating themselves as a rebel of the family. Sulloway also included a study by Beck, Burnet, and Vosper (2006) which documented weak effects of birth order on two specific facets of extraversion, but that study did not investigate birth order effects on the prominent dimensions of conscientiousness and openness.)

As noted by Marini and Kurtz (2011, p. 913), the existing within-family research on birth order and personality is limited by its use of a single rater from each family. In such studies, the single rater is comparing oneself against one's siblings and thus increasing the likelihood of perceiving a contrast. Moreover, when individuals list out their siblings (including themselves) and then nominate the one who is most characteristic of a given trait, they may unconsciously focus on themselves and their siblings in the context of their family rearing environment, where birth order is frequently noted and frequently attributed causal force. In fact, as Harris (2000, 2006) noted, if birth order effects do operate, they operate *within* the rearing environment, where it could benefit a firstborn to act more dominant and a laterborn to be more open. Such effects of the family environment do not clearly translate to personality development and behavior outside of the home. The benefit to a firstborn of being dominant over younger siblings at home does not clearly translate into a benefit on the playground with peers. Thus, even if birth order were related to sibling dynamics in the family rearing environment, it need not be related to individuals' personality traits as expressed across environmental contexts.

Given our concern with single-rater within-family studies, we collected independent self-reports on personality from both a firstborn and a laterborn sibling from the same family. As a result, we could compare two siblings' independent perceptions of their own personality traits as a function of birth order. We also asked parents to provide personality reports on each of those two individuals. That is, each young adult sibling reported on their own personality; and participating parents completed a personality profile on each of their two adult children who were involved in the study (parents did not report which child they viewed as more or less of a given trait). As a final component of our study, we obtained peer reports on our original participants to test the validity of our self-report data and to investigate whether peers of firstborn siblings perceive their friends differently than peers of laterborn siblings do. Our primary objective was to determine whether birth order effects on personality would be revealed in a true within-family design that utilizes independent self-report data from multiple siblings in the same family.

2. Method

2.1. Participants

2.1.1. Original participants and their siblings

Original participants were undergraduate students enrolled at a mid-sized public university. We informed participants at the time of solicitation that we were interested in studying sibling similarities and differences, and that their participation would necessitate eventual online involvement of a full biological sibling. We obtained 92 original participants (22 men, 70 women; mean age = 21.10, *SD* = 1.51; 34% firstborn), who completed a paper-and-pencil questionnaire voluntarily in classroom sessions. In those sessions, we asked participants to provide an email address for "the sibling who was closest to them in age". For those who were firstborns, the nominated sibling was always a laterborn; however, some of the laterborns nominated a fellow laterborn because we intentionally did not tell participants that birth order was a factor in this study. When the sibling we obtained did not complete the firstborn–laterborn pairing, we emailed the original participant to ask for their oldest sibling's contact information. We obtained contact information for 12 firstborns, and seven completed the survey. In the end, we obtained 69 sibling pairs comprised of one firstborn and one laterborn (30 male siblings; mean age of siblings = 22.20, *SD* = 4.42). Siblings were entered into a drawing for a $50 gift card (chance of winning = 1 in 20). We attempted to obtain siblings who were five years apart or less in age (Healey & Ellis, 2007), but we also did not want to turn interested participants away. Of the 69 sibling pairs, 86% were within five years of each other (mean age difference = 3.30, *SD* = 2.71 years). Forty sibling pairs were same-sex (eight were male–male and 32 were female–female; and 39 sibling pairs were mixed-sex (17 were comprised of a male firstborn and a female laterborn; 12 were comprised of a female firstborn and a male laterborn). Of the laterborns, 66% were secondborns and 34% were thirdborns or beyond.

2.1.2. Original participants' peers

We asked original participants to nominate a close same-sex friend who would be willing to provide a peer-report of their personality. A total of 79 peers (85%) responded to our electronic invitation and survey. Participants were entered into a drawing for a $50 gift card (chance of winning = 1 in 20) in return for participation.

2.1.3. Siblings' parents

Three months after we obtained data from the original participants, their siblings, and their peers, we contacted the original participants again via email. We told participants we were interested in their parents' perceptions of their children's personality traits and requested contact information for one or both parents. A total of 56 participants complied with the request. We mailed parents a child-report questionnaire and received data from 46 different families (82% response rate): six families for whom the dad responded, 13 families for whom the mom responded, and 27 families for whom both the mother and father responded. Of these 46 families, we were missing complete firstborn–laterborn data from two of them (i.e., we had obtained responses from two laterborns instead of one firstborn and one laterborn). Thus, we had parent ratings of 44 firstborn–laterborn sibling pairs.

2.2. Materials and procedure

2.2.1. Original participants

Participants completed the 44-item Big Five Inventory (BFI; John, Donahue, & Kentle, 1991), which measures openness (10 items), conscientiousness (nine items), extraversion (eight items), agreeableness (nine items), and neuroticism (eight items). We asked original participants to rate the extent to which each item described themselves, using a five-point scale (*Strongly disagree* to *Strongly agree*). At the end of the paper survey, participants reported their sex, age, number of siblings, and whether they were a firstborn or laterborn.

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2.2.2. Siblings

We sent siblings the BFI in an online format, using the email addresses provided by original participants. They were asked to self-report on the items.

2.2.3. Original participants' peers

We sent peers the BFI in an online format, using the email addresses provided by original participants. Peers provided their perceptions of the original participants' personality traits.

2.2.4. Siblings' parents

Original participants provided mailing addresses for one or both of their parents. We sent these parents a personalized cover letter stating that we were interested in the degree to which parents and their children agree about children's personality traits (birth order was not mentioned). We enclosed a personalized paper copy of the BFI and asked the parent to complete it in reference to each of their two children. The questionnaire contained two columns, one for the parent's ratings of one child and one column for the parent's ratings of the other child. The original participant's name was always inserted in the first column heading and their sibling's name in the second column heading (thus providing a natural counterbalancing of birth order). When both parents returned a questionnaire, we averaged their responses.

3. Results and discussion

Our initial analyses focused on establishing the validity of the dataset. First, as noted in Table 1, internal reliabilities for self, peer, and parent ratings of the Big Five factors were high. Second, as expected from previous research on personality judgment, original participants' self-reports of their personality coincided with their peers' and parents' judgments of their personality. As shown in Table 1, all self-other correlations were positive, and 14 of 15 were statistically significant. Third, given previous research on personality similarity among biological siblings, we expected to see weak to moderate similarity between the siblings (Loehlin & Rowe, 1992), and we did. As shown in Table 1, siblings were weakly to moderately similar in self-reported openness, conscientiousness, and neuroticism, but they were not similar in self-reported extraversion or agreeableness. The results from these analyses of internal reliability, self-other consensus, and familial similarity suggest that our dataset is robust for detecting birth order effects on personality.

3.1. Within-family tests of birth order differences in personality

We had 50% power to detect birth order effects of $d = .20$, 80% power to detect effects of $d = .30$, and over 90% power to detect effects greater than $d = .35$ (Kraemer & Thiemann, 1987). Table 2 displays firstborn and laterborn siblings' self-reported Big Five factor scores and the results of paired-samples t-tests conducted for the within-family comparisons. As shown in this table, siblings did not differ systematically as a function of birth order. Table 2 also displays parents' ratings of their firstborn and laterborn children's personalities, and the results of paired-samples t-tests conducted for the within-family comparisons. Parents' ratings of their adult children did not differ systematically as a function of birth order.

To our knowledge, no other study has attempted to investigate effects of birth order on personality using a complete within-family design; that is, by asking siblings of varying birth orders, from the same family, to provide independent self-reports of their own personality. We cannot attribute the lack of statistical significance in our design to small samples, because other researchers (e.g., Healey & Ellis, 2007) have reported moderate effect sizes, which we had the statistical power to detect. Perhaps within-family designs that rely on ratings from one family member (Healey & Ellis, 2007; Paulhus, Trapnell, & Chen, 1999) promote a specific comparison mindset. That is, instead of rating oneself in general, participants might rate themselves in comparison to their sibling. If such comparisons are operating, previous studies may have been biased toward detecting effects of birth order. We attribute the lack of statistical significance in our complete within-family design to a real absence of systematic influence of birth order on primary personality traits.

Although we did not see evidence that parents perceive their children differently as a function of their children's birth order, we did see evidence that parents perceived similarities and differences between the two children they rated. Parents' ratings of their two children's neuroticism levels were positively correlated; parents' ratings of their two children's openness, conscientiousness, and agreeableness were not correlated; and ratings of their two children's extraversion levels were *negatively* correlated. Thus, parents who perceived one of their children as highly extraverted were likely to perceive their other child as less extraverted. We do not have a clear explanation for the finding that parents perceived their children as similarly neurotic but dissimilar in extraversion. We would like to see this question explored in future research.

Table 1
Pairwise correlations for the Big Five personality factors.

	O	C	E	A	N
Consensus					
Self- and peer reports ($n = 79$)	.50***	.42***	.60***	.28*	.42***
Firstborns' self- and parent-reports ($n = 44$)	.61***	.45**	.66***	.30*	.51***
Laterborns' self- and parent-reports ($n = 44$)	.29*	.47**	.61***	.20	.34*
Familial similarity					
Siblings' self-reports ($n = 69$)	.31**	.26*	−.10	−.01	.25*
Parent reports of firstborn and laterborn ($n = 44$)	.24	.05	−.32*	.23	.51***

Note: $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$. Internal reliability coefficients for original participants' self-reports, sibling self-reports, peer reports, and parent reports range from .77 to 85 for openness, .77–.84 for conscientiousness, .87–.89 for extraversion, .66–.88 for agreeableness, and .83–.84 for neuroticism.

Table 2
Personality ratings by birth order.

	Firstborn M (SD)	Laterborn M (SD)	t	p	d
Sibling self-reports ($n = 69$)					
Openness	3.64 (0.65)	3.69 (0.52)	−0.57	.573	−0.07
Conscientiousness	3.80 (0.64)	3.367 (0.63)	1.29	.201	0.16
Extraversion	3.56 (0.83)	3.54 (0.86)	0.20	.845	0.02
Agreeableness	3.91 (0.59)	4.00 (0.51)	−0.88	.380	−0.11
Neuroticism	2.87 (0.82)	2.85 (0.76)	0.19	.850	0.02
Patent ratings ($n = 44$)					
Openness	3.62 (0.55)	3.62 (0.43)	−0.03	.981	−0.00
Conscientiousness	3.77 (0.52)	3.69 (0.67)	0.64	.526	0.10
Extraversion	3.54 (0.74)	3.38 (0.77)	0.90	.374	0.14
Agreeableness	3.95 (0.59)	3.93 (0.60)	0.17	.865	0.03
Neuroticism	2.67 (0.68)	2.79 (0.58)	−1.26	.214	−0.19
Peer ratings ($n = 79$)					
Openness	3.53 (0.70)	3.63 (0.62)	−0.64	.528	−0.15
Conscientiousness	3.78 (0.68)	3.97 (0.65)	−1.19	.239	−0.27
Extraversion	3.83 (0.91)	3.96 (0.77)	−0.66	.509	−0.15
Agreeableness	3.90 (0.86)	4.14 (0.70)	−1.34	.183	−0.31
Neuroticism	2.78 (0.82)	2.75 (0.83)	0.20	.846	0.04

Note: Sibling self-reports and parent ratings were analyzed as paired-samples t-tests, with Type I error rate set at .05; peer ratings were analyzed as independent-samples t-tests, with Type I error rate set at .05.

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3.2. Between-family tests of birth order differences in personality

A total of 79 peers of the original participants provided their assessment of the original participant's personality traits. Table 2 displays their mean ratings, by original participants' birth order, and the results of independent samples *t*-tests conducted for the between-family comparisons. As shown in the table, firstborns and laterborns in our sample were not rated differently by their peers. This finding corroborates those of several previous between-family designs of larger scale that have failed to document consistent support for hypothesized birth order differences (Dunkel et al., 2009; Ernst & Angst, 1983; Jefferson et al., 1998; Marini & Kurtz, 2011; Pollet et al., 2010; Saroglou & Fiasse, 2003).

4. Conclusion

Cultural lore and popular books advertise birth order as a key factor – in some cases, *the* key factor – to explaining why individuals turn out the way they do. The notion that birth order is significant seems to be rooted in subjective experiences or a desire to find the family environment as a source of influence on individuals' development; however, popular belief in the power of birth order is not supported by the weight of the evidence. Rather, the weight of the evidence suggests that individual differences in personality are explained by (1) differences in genetic dispositions that can drive both differences in experience and differences in response to experiences, and (2) by differences in objectively nonshared environments such as differential peer groups. We concur with Judith Rich Harris (2000): "It is time for researchers to look elsewhere – outside the childhood home – for the sources of the nongenetic variation in adult personality" (p. 177).

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