

BRIEF REPORT

An Attempted Replication of the Relationships between Birth Order and Personality

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According to Sulloway (1996), firstborn children hold positions of dominance and parental favor relative to laterborn children and, as a consequence, develop personality characteristics that coincide with parental interests. Laterborns develop personality characteristics that differ from firstborns in an effort to secure parental investment. Sulloway (1996, in press) reported support for the hypotheses that firstborn status correlates positively with Surgency and Conscientiousness and correlates negatively with Agreeableness, Emotional Stability, and Openness after controlling for sex, age, sibship size, and socioeconomic status. The authors attempt to replicate these findings with self-report data provided by several hundred young adults, including a sample of full genetic siblings and a sample of mixed (half-, step-, or adoptive) siblings. For the complete sample and the full sibling sample, they replicate the negative relationship between firstborn status and Agreeableness. Contradicting Sulloway's findings, the authors document in the complete sample and in the mixed sibling sample a positive relationship between firstborn status and Openness. They find no relationships between firstborn status and Surgency, Conscientiousness, or Emotional Stability. Discussion situates the results of the current research with previous attempts to replicate Sulloway's (1996) findings. © 2002 Elsevier Science (USA)

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Parents invest more in firstborn children than in laterborn children (for a review, see Sulloway, 1996). According to Sulloway (1996, in press), differential parental investment motivates differences in the strategies that children in the same family use to solicit parental investment. To solicit parental in-

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vestment, firstborns display beliefs, attitudes, and personality characteristics that mirror parental beliefs, attitudes, and personality characteristics; Sulloway (1996) referred to this mirroring as “upholding the parental status quo.” Laterborns use a strategy of investment solicitation that differs from that used by firstborns. According to Sulloway, laterborns develop beliefs, attitudes, and personality characteristics that differ from firstborns and from parents.

There is a long history of research on the relationships between birth order and personality scattered across the social and behavioral sciences (for a review, see Sulloway, 1996). Sulloway (1996) organized this literature and conducted a meta-analysis of these relationships. Following current and historical work in the field of personality, Sulloway organized personality characteristics into five major dimensions: Surgency, Agreeableness, Conscientiousness, Emotional Stability, and Openness (Goldberg, 1982; Norman, 1963).

Sulloway (1996) hypothesized and found that firstborn status correlates positively with Surgency (dominant, bold, sociable) because firstborns attempt to minimize diversion of parental investment by dominating younger siblings. Sulloway hypothesized and found that firstborn status correlates negatively with Agreeableness (flexible, warm, selfless). Because firstborns are in the position of dominating younger siblings, laterborns are expected to pursue strategies of parental investment solicitation that minimize confrontation with firstborns; this can be achieved by laterborns by displaying agreeableness. Sulloway (1996) hypothesized and found that firstborn status correlates positively with Conscientiousness (careful, reliable, well organized) because of a firstborn’s position of upholding the parental status quo—that is, not “rocking the boat.” Firstborns may have an initial advantage over laterborns in that they enjoy a period of exclusive parental investment. The introduction of a younger sibling may generate in a firstborn feelings of anxiety about the likely diversion of parental resources. Accordingly, Sulloway hypothesized and found that firstborn status correlates negatively with Emotional Stability (secure, even-tempered, at ease). Finally, Sulloway hypothesized and found that firstborn status correlates negatively with Openness (cultured, knowledgeable, creative). According to Sulloway, greater Openness facilitates pursuit of alternative strategies of parental investment solicitation, which benefits laterborns by motivating the pursuit of unoccupied niches within a family.

Ernst and Angst (1983) and Sulloway (1996) noted the need to include in analyses covariates that can confound real relationships between birth order and personality. These key control variables include sibship size and the socioeconomic status (SES) in which the participant was raised. Relative to firstborns, laterborns are raised in lower SES environments and are members of larger sibships. Sulloway (1996, in press) also controlled for the sex and

age of the participant because these variables are confounded with many personality characteristics (for a review, see Sulloway, 1996).

Several recent studies have failed to replicate Sulloway's (1996) findings (Beer & Horn, 2000; Freese, Powell, & Steelman, 1999; Jefferson, Herbst, & McCrae, 1998). With one exception (Beer & Horn, 2000), however, these studies did not include precisely the controls recommended and used by Sulloway (1996, in press). Although Beer and Horn's (2000) analyses included these key controls, their samples comprised adoptive siblings, not genetic siblings. Beer and Horn's analyses therefore address personality effects associated with rearing order, not birth order per se.

We attempt to replicate Sulloway's (1996) findings, separately investigating a sample of full genetic siblings and a sample that includes half-siblings, stepsiblings, and adoptive siblings, with the expectation that this analysis strategy may provide a clearer picture of the relationships between birth order and personality (see Freese et al., 1999). Sibships that include half-siblings, stepsiblings, or adoptive siblings might obscure real birth order effects by, for example, the sudden introduction of an older "sibling" (see Freese et al., 1999). We attempt to replicate the relationships hypothesized and documented by Sulloway (1996, in press) between birth order and personality first for the complete sample of participants and then separately for the full sibling sample and the mixed sibling sample. We include in our analyses precisely the same controls that Sulloway used (SES, sibship size, and sex and age of participant).

METHOD

Participants

Undergraduate students (178 men and 260 women) at a state university in the southeastern United States completed a short survey. Participants were instructed to place their completed survey in a brown security envelope to maintain anonymity. Participants ranged in age from 18 to 79 years, with a mean age of 26.0 ($SD = 9.0$). Most participants completed the survey for extra credit in their courses. The remaining participants completed the survey as partial fulfillment of a research participation requirement in an introductory psychology course.

Materials

The survey consisted of two sections. The first section collected demographic information. We asked participants to list each of their siblings in descending order by age and to include themselves. We also asked participants to indicate their relationship to each sibling (full sibling, half-sibling, stepsibling, adoptive sibling). We asked participants to circle a number corresponding to the SES in which they were raised (1 = *lower*, 2 = *lower middle*, 3 = *middle middle*, 4 = *upper middle*, 5 = *upper*).

The second section of the survey included 40 bipolar items designed to assess standings on five major dimensions of personality (example item anchors in parentheses): Surgency (dominant-submissive), Agreeableness (flexible-stubborn), Conscientiousness (careless-careful), Emotional Stability (secure-insecure), and Openness (uncultured-cultured) (Botwin, Buss, & Shackelford, 1997). For each item, participants were instructed to circle a number

between 1 and 7 inclusive that described them "generally." This measure has been shown to produce reliable and valid assessments of the five major dimensions of personality (see Botwin et al., 1997). Some of the responses provided by this sample of participants were used to investigate the relationships among birth order and sexual beliefs, behaviors, and desires (Michalski & Shackelford, in press). The current article presents the results of different analyses designed to test different hypotheses. None of the analyses reported in this article has been published previously.

RESULTS

Following Sulloway (1996), we coded birth order dichotomously, such that 1 = *laterborn* and 2 = *firstborn*. Also following Sulloway, we excluded only children from all analyses. We next grouped sibships into two mutually exclusive samples: (a) a full sibling sample in which all siblings were genetically related as full siblings and (b) a mixed sibling sample in which at least one sibling was an adopted sibling, half-sibling, or stepsibling. Fully 72% of the participants ($n = 281$) were included in the full sibling group. We computed personality dimension scores following Botwin et al. (1997) for the following dimensions: Surgency ($\alpha = .73$), Agreeableness ($\alpha = .74$), Conscientiousness ($\alpha = .69$), Emotional Stability ($\alpha = .65$), and Openness ($\alpha = .68$).

We first conducted analyses using data from the complete sample of participants (full and mixed sibling samples). Following Sulloway (1996), we computed point-biserial partial correlations between firstborn status and scores on each of the five personality dimensions. Each correlation controlled for effects attributable to participant sex, participant age, sibship size, and SES in which the participant was raised. These correlations are displayed in the first column of Table 1. Replicating Sulloway's finding, firstborn status

TABLE 1

Point-Biserial Partial Correlations between Firstborn Status and Personality Dimensions

Personality dimension	Partial correlation		
	Complete sample ($n = 380$)	Full sibship ($n = 270$)	Mixed sibship ($n = 104$)
Surgency	-.08	-.08	-.08
Agreeableness	-.09*	-.13*	.03
Conscientiousness	.02	-.02	.11
Emotional Stability	-.06	-.08	-.01
Openness	.10*	.07	.19*

Note. Partial correlations control for participant sex, participant age, sibship size, and socioeconomic status in which the participant was raised. Analyses are based on responses from participants who provided information on all target and control variables. For the full sibling sample, all siblings are genetically related as full siblings. For the mixed sibling sample, at least one sibling is an adopted sibling, half sibling, or stepsibling.

* $p < .05$.

correlated negatively with Agreeableness. Contradicting Sulloway's finding, firstborn status correlated positively with Openness. Failing to replicate Sulloway's findings, firstborn status did not correlate with Surgency, Conscientiousness, or Emotional Stability.

To assess whether the hypothesized relationships between birth order and personality are stronger in the full sibling sample, we computed point-biserial partial correlations controlling for sex, age, sibship size, and SES separately for participants from (a) full sibships and (b) mixed sibships. The results of these analyses are displayed in the second and third columns of Table 1. For participants from full sibships, firstborn status correlated negatively with Agreeableness, consistent with Sulloway's (1996) findings and replicating analyses using data from the complete sample of participants. For participants from mixed sibships, this correlation was in the same direction but did not reach statistical significance. For participants from mixed sibships, firstborn status correlated positively with Openness, contradicting Sulloway's findings and replicating analyses using data from the complete sample of participants. For participants from full sibships, this correlation was in the same direction but did not reach statistical significance.

DISCUSSION

The results of the current study lend very little support to Sulloway's (1996, in press) claims regarding the relationships between birth order and the five major dimensions of personality. In the full sample (including participants with full genetic siblings and participants with at least one adopted sibling, half-sibling, or stepsibling), the negative correlation between firstborn status and Agreeableness replicates Sulloway's finding, but the positive correlation between firstborn status and Openness contradicts Sulloway's finding. When analyses are conducted separately on data from the full and mixed sibling samples, the negative correlation between firstborn status and Agreeableness remains for the full sibling sample, and the positive correlation between firstborn status and Openness remains for the mixed sibling sample.

Firstborns are older, bigger, and stronger than their siblings, and according to Sulloway (1996, in press), firstborns use these advantages to crowd laterborns out of the spotlight of parental investment. Faced with the challenges imposed by a dominant firstborn sibling, laterborns develop a strategy of parental investment solicitation that minimizes confrontation with firstborns. According to Sulloway, Agreeableness underscores this strategy, and the current study corroborates this hypothesis for the complete sample and for the full sibling sample.

According to Sulloway (1996, in press), firstborns carve out a niche within the family, upholding the "parental status quo" in their efforts to secure parental investment. With the "do as parents do" strategy of investment

solicitation already occupied by a firstborn, laterborns are forced to pursue alternative strategies of parental investment solicitation. According to Sulloway (1996, in press), Openness underscores this laterborn strategy and motivates laterborns to fill or create alternative niches within a family. It is not clear why, in the current study, Openness correlates positively with firstborn status, directly contradicting Sulloway's hypothesis and results. Perhaps there is something peculiar about the participants in the current research, although we can offer no clear candidate for such a peculiarity. We note, however, that other researchers have either failed to replicate or have documented findings that contradict Sulloway's (1996) report of a negative relationship between Openness and firstborn status (see, e.g., Beer & Horn, 2000; Jefferson et al., 1998).

Somewhat different patterns of results emerge when the relationship between firstborn status and personality are examined separately in the full sibling sample and the mixed sibling sample. The negative correlation between firstborn status and Agreeableness documented in the complete sample is replicated in the full sibling sample but not in the mixed sibling sample. The positive correlation between firstborn status and Openness documented in the complete sample is replicated in the mixed sibling sample but not in the full sibling sample. This differing pattern of results suggests that future researchers might consider the genetic relatedness of siblings in their investigations of the relationships between birth order and personality. Based on the results for Openness, we speculate that firstborns with younger half-siblings and stepsiblings might switch from a strategy of closer parental affiliation to one of greater Openness because these younger siblings garner a larger portion of parental investment. Firstborns in this situation might adopt such a strategy because they have younger siblings related to a father present in the family who is inclined to channel investment toward his own offspring—not to a firstborn fathered through a mother's previous relationship. Future research could investigate these and other possible strategic differences among siblings of differing sibship compositions.

The current study is the first attempt to replicate in a nonadoptive sample the relationships between birth order and personality identified by Sulloway (1996), using precisely the same controls that Sulloway used (sibship size, socioeconomic status, and participant age and sex). In addition, the current study is the first to separately investigate the relationships between birth order and personality using the reports of two groups of participants: (a) participants with exclusively full genetic siblings and (b) participants with half-siblings, stepsiblings, or adoptive siblings. In summary, we find little support for Sulloway's hypotheses regarding the relationships between birth order and personality. Firstborn status is not predictive of scores on three of the five personality dimensions (Surgency, Conscientiousness, and Emotional Stability). Firstborn status predicts scores on Agreeableness and does

so in a direction corroborating Sulloway's (1996, in press) hypothesis and results. Firstborn status also predicts scores on Openness, but in a direction contrary to Sulloway's hypothesis and results.

The results of the current study at best weakly replicate Sulloway's (1996) meta-analytic findings using a large sample and with the appropriate controls included. The results of the current study, along with those of Beer and Horn (2000) and future research that similarly employs appropriate controls, can be included in a future meta-analysis that seeks to more precisely assess the relationships between birth order and personality hypothesized by Sulloway (1996). In conjunction with other failed replications, the current findings provide an additional summons to Sulloway to reconcile these failed replications with the results of his meta-analysis and with his theory of the influence of birth order on personality.

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