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Methodology, Birth Order, Intelligence, and Personality

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Conclusions about the effects of birth order on intelligence, personality, and other psychological and behavioral domains depend on the research designs used to study those effects. There are two key research designs, between-family designs and within-family designs. Rodgers, Cleveland, van den Oord, and Rowe (June 2000) used both designs to assess the relationship of birth order to intelligence. The results of the within-family design revealed that birth order is unrelated to intelligence. The results of the between-family design, in contrast, revealed a negative relationship between birth order and intelligence. Rodgers et al. concluded that the belief that birth order affects intelligence is a product of research using between-family designs and the presumption that large families produce low-IQ children. According to Rodgers et al., within-family tests of the relationship between birth order and any behavioral outcome decrease variation from variables extraneous to the family and, therefore, are preferable to between-family tests of these relationships. Rodgers et al. claimed that their "primary methodological point applies equally to any psychological or behavioral domain" (p. 600).

According to Rodgers et al. (2000), appropriate tests of the relationships between birth order and personality require a within-family design. In contrast to the null results of within-family tests of the relationship between birth order and intelligence, within-family tests document significant relationships between birth order and personality (Paulhus, Trapnell, & Chen, 1999). Using a within-family design, Paulhus et al. (1999) found that first-borns are reported to be higher achievers and more conscientious, whereas later-borns are reported to be more rebellious, agreeable, and liberal. These findings are not obtained when the same relationships are assessed using a between-family design (Freese, Powell, & Steelman, 1999, Michalski & Shackelford, 2000).

These different patterns of relationships between birth order and (a) intelligence and (b) personality require explanation. There are several differences in the logic predicting birth order relationships with intelligence and personality. For example, Sulloway's (1996) claims regarding personality were constructed around the influence that an older, dominant sibling can exert over a younger, submissive sibling. Predictions regarding birth order differences in intelligence do not necessarily reflect this sibling competitiveness. Instead, these predictions rest largely on parental willingness and ability to invest in a child, which tends to decrease as the number of siblings increases (Blake, 1987). To the best of our knowledge, no research has systematically addressed how sibling interactions affect intelligence.

Within-family designs provide several methodological advantages over between-family designs. For example, variations in social class, number of siblings, and parental personality are reduced in a within-family design because data for each sibling are collected. Each sibling is presumed to grow up with the same economic background, family size, parental IQs, and parental personalities. Is it correct to assume that the reduction in variation of these effects makes these within-family designs more appropriate than between-family designs? The answer may be no. A within-family model does not account for within-family change over time. Additional confounds can be included in both within-family designs and between-family designs. For example, a man's social status and expendable resources often increase with age (Buss, 1994). Later-born children therefore may be born into an economic situation different from that of an older sibling. This raises several issues relevant to intelligence. A father with more resources at Time 2 than at Time 1 may be more likely to distribute those resources at the time in development when they may be more important to the intellectual development of younger offspring. Although parents with low IQ or low socioeconomic status (SES) produce more offspring than high-IQ parents or high-SES parents, there is little reason for a within-family design to fail to address this potential source of variation. Perhaps the null effects presented in Rodgers et al.'s (2000) article were due to an increased ability of parents to invest in later-born offspring.

Another point regarding reduced variation in a within-family design is the assumption that children within a family share the same family size at any given time. The addition of a newborn into a family, however, may elicit different reactions from older children and younger children who are already part of the family. From an evolutionary psychological perspective, the costs incurred with parental production of additional offspring may be greater for younger siblings than for older siblings because of the diversion of parental resources toward a newborn that might otherwise have been invested in the next oldest child (Sulloway, 1996). Therefore, what siblings mean to each other as allies and as adversaries may differ with birth order. The potential for growth in family size thus may be interpreted in different ways as a function of birth order.

Intelligence can be defined as the mental abilities necessary to effectively adjust to one's environment as well as to effectively shape and select one's environment (Stemberg, 1997). Intelligent individuals have the ability to maximize
success either by adjusting their behaviors to the local environment or by manipulating their environment to facilitate their strengths. This definition of intelligence parallels the logic that Sulloway (1996) proposed regarding later-born disadvantage. Often, later-born characteristics that later-borns adopt to increase parental investment. It is possible that, given the methodological issue at hand, it may not be intelligence per se that varies with birth order but the ways in which intelligence is used. Intelligence may be used by siblings to develop personalities that best utilize their niche. Perhaps this is why within-family designs yield differences in personality but not intelligence as a function of birth order. Within-family designs may identify only the absence of a relationship between birth order and intelligence. Further research could profitably address (a) the ways in which intelligence is used in personality and (b) confounds not previously included in either between-family or within-family studies of birth order.

REFERENCES


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