

Evolutionary psychology, birth order and family dynamics

The influence of birth order on human personality traits has intrigued psychologists¹ and has been controversial². Some have concluded that birth order has no effect on personality¹. However, in 1996, Frank Sulloway published *Born to Rebel: Birth Order, Family Dynamics and Creative Lives*, in which he assembled a large, detailed database relating birth order to various aspects of personality using historical records and expert raters³. Sulloway's analysis demonstrated strong relationships between birth order and personality. In particular, latterborns tend to be more rebellious, creative, open to radical ideas, risk-prone, cooperative and diverse in their interests than firstborns.

Sulloway explained these differences in terms of competition for parental investment. He argued that firstborns typically have been guaranteed the major share of the resources and attention provided by parents. This might occur through parental preference; under difficult circumstances, parents do tend to prefer firstborns to latterborns⁴. Firstborns also get a head start on younger siblings by being the only target of investment available until the younger siblings are born. Finally, this headstart might allow firstborns to manipulate parental investment in their own interest in spite of attempts by parents to invest equitably. Hence, latterborns might have to find alternative ways to compete for parental resources. Sulloway argued that rebelliousness, creativity, openness to radical ideas, cooperativeness and diversity of interests are latterborn strategies designed to increase the proportion of parental investment received.

Catherine Salmon and Martin Daly, two evolutionary psychologists from McMaster University in Canada, have explored the influence of birth order in contemporary populations, focusing on affiliation with kin. Salmon and Daly⁵ investigated the question of whom people consider to be their closest associates and confidants, whom they would turn to in times of distress, and the degree to which they take an interest in family history (genealogy). However, Salmon and Daly add a new twist to the evolutionary approach to sibling strategies, using arguments derived from life-history theory. They point out that the value of each offspring increases relative to each parent's residual reproductive

value with increasing parental age⁶. Lastborns should experience enhanced investment from parents because they represent the last opportunity for parents to invest in direct offspring. Hence, middleborns should suffer the most in terms of reduced parental investment. Previous research indicates that middleborns do, in fact, receive less investment from parents⁷.

In their first study, Salmon and Daly gave a questionnaire to 300 undergraduates (half females), covering various aspects of personal background, and including the following question: to whom, of all people that you know, are you closest? The questionnaire also implemented the Hartley self-identity assessment, in which the subject responds to the question: who are you? Responses were categorized as (1) familial role (e.g. daughter), (2) family name or (3) not family related.

Controlling for both the number of siblings and their gender, firstborns (64%) were more likely to name a parent than either middleborns (10%) or lastborns (39%), and lastborns were more likely to do so than middleborns. In addition, firstborns and lastborns with older mothers were significantly more likely to nominate their mother as their closest associate, compared with those with younger mothers. The self-identity assessment gave similar results, with 68% of firstborns mentioning a family role or name, compared with 57% of lastborns and 38% of middleborns.

In their second study, Salmon and Daly investigated the question of whom people would turn to for assistance in times of distress. This study involved 140 undergraduates, who were given a questionnaire containing, among other questions, two scenarios, one involving emotional upset (witnessing a lethal car crash) and one involving financial distress (job loss and mortgage foreclosure). For the first scenario, the question was: whom would you turn to for emotional support? For the second scenario, the question was: whom would you turn to for financial support? For the question concerning emotional support, firstborns (42%) and lastborns (44%) were more likely to pick a parent than middleborns (21%). For financial support, firstborns (87%) and lastborns (81%) were also more likely than middleborns (63%) to choose parents.

In their third study, Salmon and Daly investigated the effect of birth order on interest in genealogy. They used two approaches: an investigation of Canadian historical archives, and questionnaires administered to a sample of volunteers from genealogical newsgroups on the Internet. The archival samples compared the birth orders of the compilers of familial histories in two rural communities of Binbrook, and Ontario and Antler, Saskatchewan. In both communities, firstborns and lastborns were significantly more likely than middleborns to compile a family history, for both male and female samples. For the one hundred Internet genealogy-newsgroup respondents (44% female), there was also a significant effect of birth order, with higher participation by firstborns than either middleborns or lastborns.

Salmon and Daly's research supports Sulloway's contention that birth order affects personality, in this case as it relates to familial association and identity. Their results also reveal a previously unexplored difference between middleborns and lastborns in these aspects of personality: lastborns appear to identify with family members more strongly than middleborns, possibly because parents increase investment in lastborns because they are the parent's last opportunity to invest in direct offspring. Finally, Salmon and Daly's research suggests a potential alternative to Sulloway's hypothesis that rebelliousness, creativity, risk-taking, diversity of interests and cooperativeness are latterborn strategies to acquire a larger share of parental resources. Salmon and Daly's results suggest that these traits might aid latterborns (especially middleborns) not in acquiring parental investment, but in establishing reciprocal alliances with non-kin. These results fit well with recent work suggesting that alliances with peers can be of critical importance to even very young children².

Other recent research by Salmon⁸ supports the idea that middleborns are less influenced by kin ties than firstborns and lastborns, and more oriented toward relationships with non-kin. The use of kin terminology is a frequent tactic used by speakers to evoke cooperation or altruism from non-relatives. Salmon investigated the question of whether using kin terminology has an effect on individuals exposed to it, and on whether the effect differs according to birth order.

Salmon used experimentally manipulated political speeches containing motivational references to kinship, friendship or citizenship, combined with before and after questionnaires designed to ask the same questions twice in an unobtrusive

manner, embedded within the questionnaire. The questions addressed the subject's agreement with key arguments made in the speech.

Using analysis of covariance, Salmon found a significant interaction between birth order and speech effectiveness. Speech containing kin terminology was significantly more effective in evoking a change in the level of agreement in firstborns and lastborns, as compared with middleborns. In contrast, speech containing references to friendship was significantly more effective in evoking a positive change in middleborns, compared with firstborns or lastborns. Salmon contends that these results suggest that middleborns, because they receive less support from their families, are more inclined to seek support through reciprocal relationships with non-kin.

Salmon⁹ has also investigated the influence of both birth order and parental birth order on contact with grandparents. In particular, she investigated the frequency with which individuals make contact (via phone and visits) with maternal and paternal grandparents according to birth order, gender, maternal versus paternal lineage and parental birth order. Salmon administered a questionnaire to 112 undergraduates (66 female, 46 male) that addressed the frequency of visits and phone contact to grandparents, and the birth order of the subject's parents. A repeated measures analysis of variance on the frequency of contact with maternal or paternal grandparents showed a significant effect of sex and side of the family, but no significant effect of subject's birth order. However, there was an additional effect of the subject's parent's birth order. The mother's birth order had a significant effect on contact with maternal grandparents, and the father's birth order had a similar effect on contact with paternal grandparents: in both cases, grandchildren saw less of their grandparents when the relevant parent was middleborn. Hence, the birth order of a parent influences the level of affiliation found between grandchildren and the grandparents on the parent's side.

Some of Sulloway's conclusions have come under criticism from Harris². Harris argues that the relative sample size of studies supporting birth-order effects on personality found in Sulloway's meta-analysis of studies on contemporary populations might be inflated because of non-publication of results from small studies that did not find an effect. Salmon and Daly's work suggests one possible reason that significant effects of birth order might often be missed:

if middleborns and lastborns are treated as equivalent, this might obscure important differences in personality between these two categories. Sulloway's prediction concerning birth order and status-striving has also been supported in a recent study of modern Canadians that controlled for sibship size¹⁰.

Sulloway discusses his results in the framework of character displacement between species. However, a more appropriate framework is that of alternative strategies, which concerns morphological, physiological and behavioral diversification of alternative phenotypes within species¹¹. The idea of alternative strategies with respect to human personality has been discussed by Gangestad¹². A variety of research has been done on alternative strategies in non-human animals, and in most cases the pursuit of particular tactics within a strategy is environmentally controlled¹¹. This emphasis on environmental plasticity parallels Sulloway's argument that siblings pursue exquisitely contingent tactics in response to the familial environment. This framework is more appropriate for the phenomenon of birth-order personality differences in humans, and the comparison might also promote the exploration of similar effects in non-human animals.

The publication of Mock and Parker's book, *The Evolution of Sibling Rivalry*¹³, confirms the strong interest many behavioral biologists have in sibling competition. Recent research has uncovered sophisticated tactics of competition by juvenile siblings as a function of birth order¹³. Birth order may affect the adult strategies of siblings in birds, particularly in cooperatively breeding species¹³. Avian parents have also been found to employ tactics of hormonal packing (e.g. providing extra amounts of testosterone to specific offspring) designed, in some cases, to mitigate the effect of birth order on competitive ability and, in other cases, to enhance it¹³. In mammals, there is considerable evidence for birth-order effects on the acquisition of status within troop-dominance hierarchies in primates¹⁴. Nevertheless, the effect of birth order on the pursuit of alternative strategies by individuals later in life (after the juvenile stages) remains a relatively unexplored area in animal behavior.

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