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## Birth Order



Radim Kuba<sup>1,2</sup> and Jaroslav Flegr<sup>1</sup>

<sup>1</sup>Department of Philosophy and History of Science, Faculty of Science, Charles University, Prague, Czech Republic

<sup>2</sup>Department of Biology Education, Faculty of Science, Charles University, Prague, Czech Republic

## Synonyms

[Family constellation](#); [Sibling constellation](#)

## Definition

Birth order refers to the sequence in which children are born into a family. It has been suggested that birth order can subtly influence personality, behavior, and interpersonal relationships due to potential differences in parental expectations, sibling interactions, and family dynamics associated with each position.

## Introduction

Environmental factors significantly influence the phenotypes of both experimental animals and humans. A key factor in this context is the family environment, which plays a crucial role in shaping

character and physiological traits. This concept is integrated within evolutionary psychology, highlighting the variance in strategies toward offspring based on birth order.

Siblings, despite sharing approximately half of their genetic material from the same biological parents, and growing up in a similar family setting, often display strikingly divergent psychological profiles and behaviors. These variations resemble differences found among unrelated individuals (Plomin & Daniels, 2011; Sulloway, 1997). Such disparities are attributed not solely to genetics but are predominantly environmental, with non-shared external factors, notably peer influences, playing a significant role. It is widely agreed among researchers that unique family dynamics shape the distinct personalities and behaviors of siblings, influencing each one in varying ways.

The characteristics of siblings, classified as firstborns (including only children) and laterborns, often share similarities within these birth order categories. Therefore, it is plausible that siblings within the same family, regardless of their birth order position, may develop differing developmental and personality traits.

However, despite considerable research affirming the influence of birth order on personality, findings across studies remain inconsistent. The debate over the explanations for these variations persists, with no unified consensus on the underlying mechanisms or the extent of their effects. Some scholars argue that the observed

birth order effects may be artifacts of the methodologies employed in studies (Ernst & Angst, 1983; Rodgers, 2001). Critics of birth order theory explain differences between siblings by attributing them to variations in genetic predispositions, which, they argue, may lead to disparities in experiences, their perception, and reactions to these experiences. They further mention the influences of objectively non-shared environments, such as different peer groups. Consequently, the academic community is divided, with continued debate and lack of agreement regarding the impact of birth order on educational and academic outcomes.

## Research History

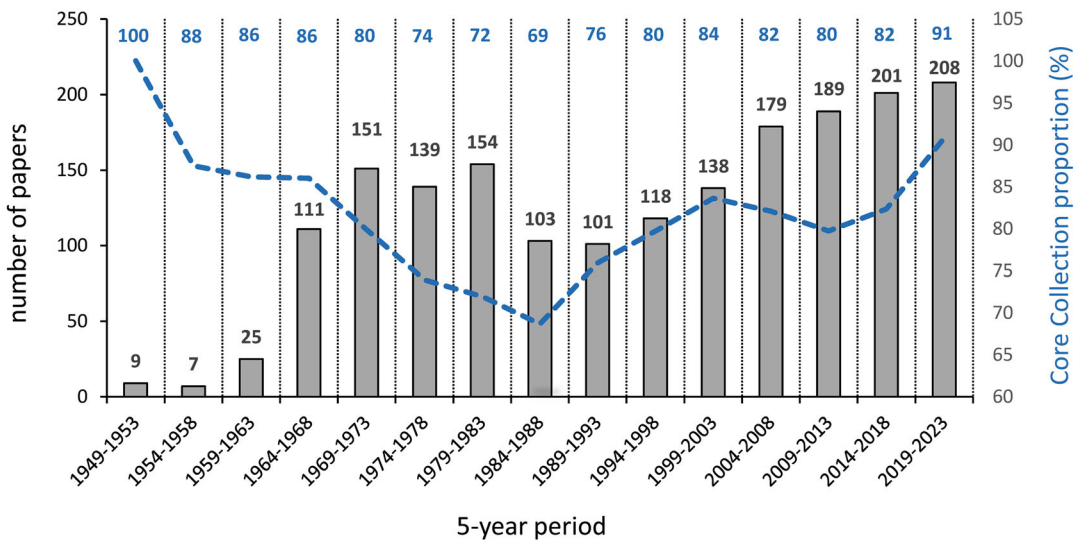
Birth order has been discussed as a factor affecting individuals for over 150 years. The examination of sibling dynamics has varied, with notable figures highlighting different aspects. Historically,

birth order has enabled some individuals to gain privileges, titles, and honors, a phenomenon exemplified by the principle of primogeniture.

In the late nineteenth century, Francis Galton (1822–1911) noted a higher representation (48%) of firstborns and only sons among English scientists, initiating discussions on birth order's influence. Galton suggested that firstborns have more control over their destiny.

Alfred Adler (1870–1937), an Austrian doctor and psychologist, is considered the pioneer of sibling constellation theory. He argued that birth order provides unique experiences and perspectives, significantly shaping personality. It's important to note that, like most contemporary experts, Adler spoke primarily of strong tendencies or probabilities rather than absolute certainties.

Research on family constellations has intensified since the second half of the twentieth century, yielding many publications (Fig. 1). Schachter's work, often contrasting Adler's views, suggests



**Birth Order, Fig. 1** Number of papers indexed in WOS bibliographic database. Using the Web of Science bibliographic database, all indexed papers meeting the criteria containing the term “birth order” in their title were retrieved. The gray bars represent the number of papers in the Web of Science Core Collection, each bar accompanied by a distinct number above in gray color. The blue line indicates the proportion of papers listed in the WOS Core Collection compared to the entire WOS database, with a distinct percentage above in blue color. The figure shows

that since 1950, the number of papers has steadily increased, peaking in the 1970s. Subsequently, a decline is observed, likely in response to heightened scrutiny of methodological aspects. However, since the late 1990s, there has been another notable increase, continuing to the present. A higher proportion of papers listed in the WOS Core Collection versus the entire WOS database might indicate that the subject matter is considered more significant from a scientific perspective

that eldest children are more likely to achieve fame, attend prestigious universities, and perform academically better, but are also more dependent and susceptible to influence. Walter Toman's seminal work in 1965 analyzed the impact of family dynamics on personality and partner relationships, although methodological criticisms later emerged. However, from this period also emerged several primary models and hypotheses that attempted to elucidate the dynamics of the influence of birth order on individuals.

"Born to Rebel: Birth Order, Family Dynamics, and Creative Lives" (1997) represents a significant contribution, offering insights from over two decades of research on birth order. The author, Frank J. Sulloway, gathered a vast amount of valuable data and presented the results of analyses of not only contemporary but also many historical events and personalities in his book. Despite criticisms, particularly regarding methodology or research outcomes failing to support the theories (e.g., Richards et al., 2023), Sulloway's work remains a notable milestone in the field.

Additionally, popular science literature addresses the effects of birth order on various aspects of life, such as therapy, family relationships, personal development, and communication. However, it is important to approach these claims with skepticism, as many are not supported by scientific evidence.

## Methodology and Sibling Categorization

Research on birth order faces numerous challenges, leading to its status as a contentious and debated field. Key issues include inconsistent categorization of birth order positions and a tendency for conclusions to be post hoc speculations that attempt to explain sibling differences. The literature often confuses causality with correlational variables, adding to the ambiguity. A closer inspection of certain studies sometimes shows that evidence claimed to support birth order differences is either misleading or weak. A significant focus on firstborns' personality and behavior may bias the overall understanding of

birth order effects. Due to these methodological flaws and occasional accusations of result manipulation, many critics doubt the existence of significant birth order effects, arguing they may not be as important or clear-cut as once believed.

## Biological Versus Psychological Birth Order

Birth order can be classified as either ordinal (biological) or functional (psychological), with both aspects offering unique insights into sibling dynamics (Carette et al., 2011; Eckstein et al., 2010; Sulloway, 1997). Ordinal birth order assigns siblings to categories (firstborn, secondborn, thirdborn, etc.) based on their birth sequence. This method is widely used in analyses, although some studies adopt the concept of relative birth order, calculated e.g., as the ratio of the number of older siblings to the total number of siblings.

While biological factors associated with birth order may influence individuals (e.g., physiological-anatomical differences), functional birth order, which considers the context and interpretation of one's birth position, seems to have a more substantial effect (Carette et al., 2011). Typically, biological and functional birth orders coincide, but exceptions can occur due to changes in family dynamics, such as divorce, the death of a sibling, the introduction of stepsiblings, or a significant age gap between siblings. These changes can shift an individual's personality traits beyond what is traditionally expected based on birth order. Thus, functional birth order seems to provide a more accurate reflection of the individual's upbringing.

## Firstborns Versus Laterborns

Building on Alfred Adler's foundational categorization, which provided a comprehensive description of sibling positions, research often utilizes four basic categories: only child, firstborn, middleborn child, and youngest child (referred to as lastborn—"Benjamin"). Individuals are classified based on their actual birth order and relative position within the sibling group.

Many researchers simplify this categorization by grouping only children and actual firstborns into a single "firstborns" category and combining

middleborn and youngest children into a “laterborns” category. This approach is based on the premise that significant differences are most pronounced between firstborns and all other positions, due to the unique status firstborns have within a family (Alabbasi et al., 2021; Sulloway, 1997).

However, some studies caution against oversimplification, noting that merging middleborn and youngest children can obscure distinct differences and potentially skew results (Salmon, 2003). The “middleborn child” category, serving as a catch-all for any child between the oldest and youngest, may not accurately reflect the diverse experiences of middleborn children in varying family sizes. For instance, a third child in a three-child family occupies a different position than a fifth child in a six-child family, a nuance lost in broad categorization.

Moreover, research has linked larger sibling groups with various socioeconomic, religious, and racial family backgrounds, suggesting that sibling set size significantly influences outcomes (Ernst & Angst, 1983). Therefore, analyses using sibling position categorization must carefully account for sibling set size to ensure accurate interpretation of results.

### **Between-Family Versus Within-Family Studies**

The methodology behind studies exploring birth order effects is critical, encompassing two primary research designs: between-family studies and within-family studies. Each design has distinct advantages and disadvantages, shaping the research findings.

Between-family studies analyze birth order effects by comparing individuals from different families. This approach allows for a broad assessment of birth order impacts across a diverse sample, facilitating the identification of general patterns and trends. However, it may also introduce variability due to the differences in family environments and contexts, potentially confounding the results.

Within-family studies, on the other hand, focus on gathering data from siblings within the same family. This design minimizes the environmental variability present in between-family studies,

offering a clearer view of birth order effects by holding constant many external factors. While this approach provides a more controlled examination of birth order, it may not capture the full range of external influences that can affect individuals’ development and behaviors.

Both approaches offer insightful perspectives on the phenomena associated with birth order effects. However, due to the intrinsic advantages and drawbacks of each method, they may yield divergent observations and interpretations (e.g., Michalski & Shackelford, 2001).

### **Origins of Differences**

This theory is predicated on the notion that the family serves as the primary environmental factor influencing an individual from birth. Despite cohabitation, siblings do not experience the family setting identically. Birth order places each child into a distinct psychosocial context, shaping their development pathways (Plomin & Daniels, 2011; Sulloway, 1997). The firstborn, for example, is introduced to a nascent family dynamic, monopolizing parental attention as parents adjust to their roles. Subsequent children enter a family with existing sibling relationships, necessitating the division of parental focus and resources. Parent-child and sibling-sibling interactions are heavily influenced by birth order. Furthermore, the structure of the family, including the total number of children, intervals between births, sibling genders, and gender ratios, significantly impacts these dynamics. This has led to the proposal of various hypotheses and models, especially regarding the implications for human cognition and intelligence.

### **Differences in Parental Approach**

Differences among siblings are often interpreted in connection to varying approaches based on parental aging and experience, and attributed to Darwinian evolutionary principles, highlighting parental investment as a primary source of variance. Parental resources, being finite, necessitate strategic distribution to maximize offspring survival and, by extension, parental reproductive

success. Offspring compete for these resources, their interests diverging from parental ones, leading to parent-offspring conflict. This conflict is pivotal for understanding family dynamics and birth order effects.

Evolutionary pressures for optimal biological fitness have shaped parents' psychological and motivational mechanisms for allocating resources among offspring under constraints, leading to varied resource distribution in certain contexts. Birth order significantly influences this distribution, affected by the offspring's age and proximity to reproductive viability, thus impacting their value from a parental fitness perspective.

Specifically, firstborns enjoy a unique advantage by monopolizing parental investments from birth, receiving undivided material and immaterial resources during critical early life stages when dependency on parental care is highest. They benefit from extensive parental caregiving time, which naturally diminishes with the arrival of subsequent siblings, leaving less for younger siblings. Conversely, laterborn siblings, especially the youngest, may benefit from increased material resources, correlating with parental age and financial stability, potentially offering advantages in later life stages, such as covering college expenses. Despite this, firstborns tend to receive the highest educational investment, with younger siblings facing constrained resources due to prior allocations (de Haan, 2010; Sakata et al., 2022).

In well-resourced families, typical of developed Western societies—the primary source of most scholarly research on birth order effects—parents strive for equitable distribution among children, a finding supported by empirical studies (Daniels et al., 1985). However, this effort paradoxically results in investment disparities across birth orders, disadvantaging middleborn children due to the cumulative nature of resource allocation over time. Firstborns experience a period of exclusive resource access, while lastborns inherit the majority of parental resources after older siblings move out. Middleborn children, who share resources throughout their upbringing, may find themselves in a less favorable position. This situation can adversely affect their self-esteem, parental relationships, and external social interactions

more significantly than it does their siblings (Salmon, 2003).

### Models and Hypotheses

These principles have evolved into a multitude of specific models and hypotheses, largely derived from the parental investment theory:

- **Confluence Model:** Introduced by R. Zajonc (1979), the “confluence model” is based on the segmentation of the intellectual environment within a family, positing that the direct influence of parents on offspring varies according to birth order. This model suggests a negative impact of higher birth order on education and intelligence, focusing on age gaps, family size, and the role of the teacher as pivotal factors. While some empirical studies support this model, its validity is increasingly questioned (Downey, 1995; Steelman & Powell, 1985).
- **Resource Dilution Model:** The “Resource Dilution Model” (RDM) by J. Blake (1985) examines how finite family resources, such as time and money, are distributed among siblings, affecting their educational outcomes. The model proposes that as the number of siblings increases, the resources available per child decrease, potentially disadvantaging younger siblings in educational attainment (Downey, 1995; Karwath et al., 2014). Although firstborns often receive more resources, resulting in better educational achievements, larger age gaps can mitigate this effect for younger siblings. Despite its empirical support, the model's applicability varies with family size and socioeconomic status.
- **Sibling Competition and the Family Niche Theory:** The Competitive Hypothesis, closely related to the RDM, suggests that both mechanisms likely operate simultaneously. While the RDM attributes sibling differences to parental resource allocation, the Competitive Hypothesis emphasizes the sibling perspective. Sulloway (1997), in “Born to Rebel,” compares the family environment to ecological niches, underlining sibling competition for resources (de Haan, 2010). This theory,

drawing from Darwin's principle of divergence and other evolutionary biology theories, explains sibling diversification within a family as a strategy to minimize rivalry and maximize parental resource acquisition. Such competition encourages siblings to differentiate their interests and specialize, thus reducing rivalry. This diversification is sometimes described through disruptive selection, favoring more extreme traits over average ones, unlike stabilizing selection.

### **Beyond Birth Order: Admixture Hypothesis**

The "Admixture Hypothesis" (AH) challenges the significance of birth order effects, proposing that what are perceived as effects of birth order may actually be reflections of other closely related factors, such as maternal age and family size, rather than birth order itself (Kristensen & Bjerkedal, 2010). The AH contends that the impacts attributed to birth order are in fact proxy outcomes for variables like socioeconomic status, parental education, and nutrition quality. It suggests that differences between birth orders within individual families are minimal, and that broader observed disparities can be attributed to the mixing of diverse family types in research. Critics, including Rodgers (2001), emphasize the importance of incorporating careful demographic considerations in birth order studies, pointing out significant findings even within homogenous populations.

### **Specifics of Individual Birth Order Positions**

Researchers have identified that each birth order position is associated with distinct developmental characteristics and unique childhood conditions, which can influence the personality and values of individuals leading to observable birth order effects.

#### **Only Children**

The interaction with parents is a crucial factor in the emergence of birth order differences, with age often highlighted in this context. It is argued that

older parents tend to approach parenting differently than younger ones, usually being financially and professionally more secure, and having more stable personal lives. Conversely, younger parents may exhibit parental inconsistency due to inexperience, leading to inconsistency in some aspects of upbringing.

The dynamics of young parents raising their first child can be notably ambivalent. They may oscillate between being overly demanding and strict, and being excessively cautious, uncertain, and inconsistent. It has been suggested that discipline and routine within the family tend to relax with each subsequent child. Studies indicate that firstborns often learn to walk, talk, and read faster than laterborn children (Chandna & Bhagowalia, 2024), likely benefiting from significant parental attention and encouragement. However, these early differences typically do not lead to substantial shifts in developmental timing with long-term impacts.

The peer relationships of only children also present unique challenges. The considerable attention they receive from adults may make establishing relationships with peers more difficult for them compared to children with siblings. They tend to relate better with either older or younger children, reflecting a trend where firstborns are more adult-oriented while laterborns are peer-oriented, a pattern statistically confirmed.

Distinct from firstborns, only children often show a lower need for affiliation, higher self-esteem, and a propensity toward egotism (Eckstein et al., 2010). These differences are primarily attributed to the absence of siblings, potentially leading to challenges in peer communication and forming close relationships.

#### **Firstborns**

Firstborns, having initially experienced life as only children, exhibit characteristics akin to them, yet with distinct variations observable across a broader demographic (Eckstein et al., 2010; Sulloway, 1997). These similarities are profound, with only children often presenting amplified firstborn traits.

The introduction of a second sibling marks a pivotal shift for a firstborn, often leading to

psychological distress manifesting as desperation, aggression, and hostility toward the newcomer. This reaction, stemming from a sense of “dethronement” signifies the firstborn’s struggle with losing undivided parental attention. The disruption in psychological equilibrium might halt or regress developmental progress, further reflecting in firstborns’ notably lower levels of trust and cooperation compared to their siblings.

Responsibilities often fall to firstborns in sibling care, entrusting them with oversight and accountability for younger siblings. This dynamic fosters a “firstborn syndrome,” where firstborns feel compelled to excel in all aspects and also present a teacher role for their siblings. Such social pressures can strain the firstborn’s psyche, notwithstanding the fact that they typically receive more parental feedback than their younger counterparts.

### Laterborns

Laterborns, encompassing all siblings born after the firstborn, are divided into two primary groups: middleborns, who have both older and younger siblings, and lastborns, often referred to as the family “Benjamins,” occupying the final position in the birth order.

In contrast to firstborns, laterborns do not receive the same level of exclusive parental attention and advantages initially. While they may not experience the specific “dethronement” event that firstborns encounter, they still engage in sibling rivalry and strive for their own recognition and place within the family hierarchy.

### Middleborns

Middleborns arguably navigate the most complex family dynamics. Born into a position lacking the firstborn privileges or the singular attention often afforded to lastborns, they find themselves in a unique and challenging familial role. Sulloway (1997) views this through an evolutionary lens, suggesting a survival and resilience focus, historically placing middleborns in a demanding survival scenario due to less parental investment compared to their siblings.

Research by Salmon (2003) underscores middleborns’ distinct familial and social dynamics:

they show a higher appreciation for friendships, less perceived parental favoritism, and a more significant inclination to seek support outside the family unit. Parental investment studies reveal that middleborn children receive the least attention and resources, often leading to feelings of neglect and lower self-esteem compared to their siblings. Instances of parental favoritism further highlight this, with middleborn children seldom being the favored child or the chosen confidante in times of need.

The combination of these conditions and manifestations can be referred to as the “middleborn child syndrome.”

Amidst these challenges, the external orientation of middleborn children equips them with robust communication and social skills, making them adept at building and maintaining friendships (Eckstein et al., 2010; Salmon, 2003).

It is, however, noteworthy that some researchers found no significant differences between middleborn and lastborn individuals (e.g., Alabbasi et al., 2021).

### Lastborns

Lastborns, uniquely positioned as the youngest family members, navigate a distinct familial landscape defined by their status as the final child. Their developmental and social dynamics are shaped by the inherent need to compete with older siblings for parental attention and resources.

On the one hand, lastborns face the challenge of their achievements being less novel and celebrated compared to those of firstborns, due to parents having previously experienced these milestones. However, they often enjoy a more relaxed familial atmosphere, benefiting from lenient rule enforcement and greater empathy from parents, grandparents, and older siblings. This nurturing environment, coupled with the guidance provided by the age gap, significantly impacts their development.

Lastborn children exhibit the highest sociability and friendliness, high self-esteem, the lowest level of intellect (Black et al., 2011; Eckstein et al., 2010), and caution. They are most prone to alcoholism and are overrepresented among patients with mental disorders. Together with

only children, lastborn children exhibit usually the greatest risk of psychiatric illness. Adult lastborn children are most frequently chosen by their mothers as the children they have the closest emotional relationship with.

While Sulloway's theory positions lastborns as the family's principal rebels, other studies suggest their inherent friendliness, empathy, and strong parental bonds may diminish the impetus for rebellion, particularly when compared to middleborns. However, certain findings point to an increased likelihood of arrest among youngest siblings, alongside an assumption that psychopathological effects may be more pronounced in this group.

### Factors Influencing Birth Order Effect

The birth order effect is influenced by various factors, including personal dispositions, family dynamics, and environmental influences. Key factors include are parents and siblings, including their sex and the spacing in age between siblings. However, additional factors such as family socioeconomic status, culture, race, and many others also play significant roles. Below is an overview of the main factors.

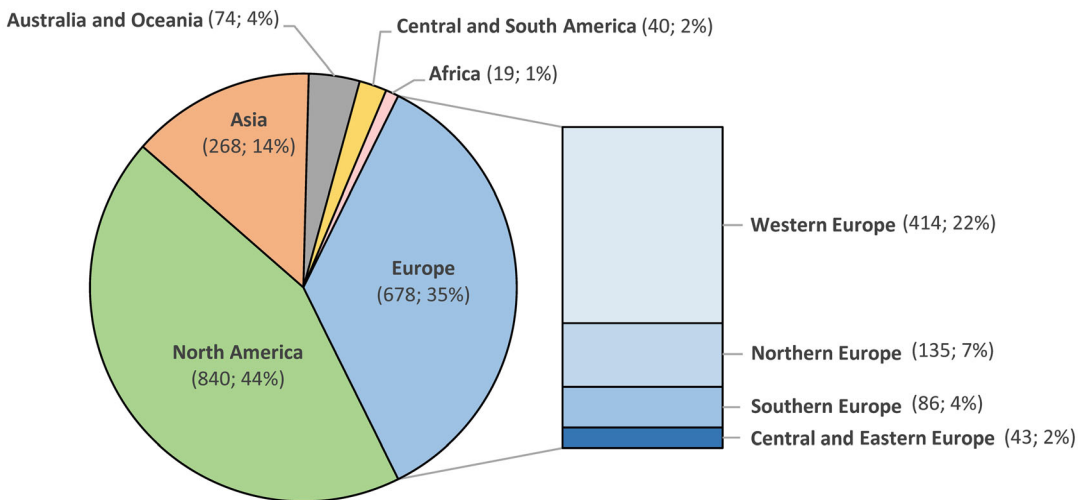
Factors arising from family and parenting:

- **Family Environment:** The family environment plays a pivotal role in a child's development, with factors such as birth order being highly conditional on socioeconomic conditions and cultural contexts. Particularly in early ontogeny, the quality of social contacts with parents outweighs the quantity, as evidenced by studies showing that siblings with closer relationships with their mother and better relationships with siblings exhibit higher psychological wellbeing and emotional stability.
- **Parental Age:** The timing of the birth of the first child is closely associated with life conditions, parental education, marital status, and partnership stability. While factors influencing the timing of the first child are relatively well-known, the consequences for the child remain less understood. Few studies adequately control for parental age, which is essential for a comprehensive understanding of its effects. Interestingly, the timing of family formation does not significantly impact the amount of time parents spend with their child or their overall satisfaction. It has been identified as a significant factor influencing various aspects of child development, including intelligence and educational attainment (Zajonc, 1976). Moreover, children born to older mothers tend to exhibit higher IQ, attain higher levels of education, and demonstrate better academic abilities.
- **Parental Attitudes:** Furthermore, family dynamics, such as parental favoritism and the quality of relationships, have been recognized as crucial elements impacting child development. Parental education shapes attitudes toward children's educational outcomes, yet the interaction with birth order effects is debated (Kristensen & Bjerkedal, 2010). Parental affection toward specific children, though logical due to similarities in traits, can lead to perceived favoritism, which may affect a child's development (Sulloway, 1997). Furthermore, parents serve as models for the development of a child's sexual and social roles.
- **Shifts in Family Structures:** The ongoing shifts in family structures, such as increased divorces, underscore the continued importance of the family unit in child upbringing. Divorce rates have been shown to significantly affect children's wellbeing, particularly in single-parent households, which often face socioeconomic disadvantages. Additionally, divorce rates have been associated with lower educational attainment, particularly in families with only one child or only daughters (Kristensen & Bjerkedal, 2010). However, the negative effects of divorce on children may vary based on factors such as the presence of a stepparent.
- **Socioeconomic Status (SES)** and parental resources significantly shape birth order



effects, affecting educational investments and aspirations. Wealthier families typically invest more in education, particularly for firstborns. However, resource allocation may vary non-linearly with family size, posing challenges for educational attainment (Downey, 1995) (with opposite trends observed in Western states compared to Southeast Asia, for example). Parental planning and resource depletion also contribute to differential investments across birth order. It has been documented that parents from higher socioeconomic backgrounds have lower aspirations for their laterborn children, especially if the firstborn has already achieved a certain level of education (e.g., high school). Birth order effects may be more pronounced in developed populations, while compensation mechanisms and inheritance practices mitigate disparities in poorer families. Additionally, societal factors like child labor and gender norms influence educational opportunities, particularly in countries with prevalent child labor practices.

- Cultural Environment:** Cultural, national, and racial contexts influence the manifestations of birth order effects. Racial differences in family size and educational attainment further underscore the influence of cultural context. This factor is accentuated by frequent criticisms regarding the uniformity of countries and regions from which the papers originate. It is known that birth order effects differ according to the cultural environment therefore, creating generalizations based solely on the main trend of results could be misleading, as the distribution of papers across various countries is not equal. Disparities in the distribution of papers across regions of origin are depicted in Fig. 2. It shows that the vast majority of publications originate from North America (44%) or Europe (35%). However, upon closer analysis, only 2% of papers come from Central and Eastern Europe. Similarly, only 2% of papers are from Central and Southern America, and 1% are from Africa. These regions are thus severely underrepresented in birth order research.



**Birth Order, Fig. 2** Number of papers indexed in WOS bibliographic database by region. The number in brackets represents the distinct number and percentage of the total of 1919 records. The inset figure provides a more detailed breakdown of articles from Europe into four main geographical areas (state affiliation to region is based on EuroVoc by the Publications Office of the European Union). Data Retrieval Method: Using the Web of Science

Core Collection, all indexed papers meeting the criteria containing the term “birth order” in their title were retrieved; filtered by Country/Region (data from 1948 to April 2024). It should be noted that the data are based on the authors’ stated nationality, which may not necessarily reflect the region from which the relevant data originate; however, they often align

Factors connected to siblings:

- **Number of Siblings:** Confluence Model and the Resource Dilution Model suggest that having more siblings can hinder individual achievement due to shared resources, potentially lowering performance for all. This idea is supported by the quality-quantity model, which suggests a trade-off between family size and the education each child receives. Parents may choose fewer children to prioritize quality upbringing and education. The probability of attending school and the total years of education decline with each additional sibling, especially impacting the firstborn's chances of educational success. Firstborns from large families and individuals from large families, in general, have been found to demonstrate better educational outcomes and higher expectations, suggesting that larger family sizes may offer comparative advantages and intensify motivational factors (Kristensen & Bjerkedal, 2010).
  - **Gender:** A substantial portion of the variation in relationships between birth order and personality traits can be attributed to gender differences. For instance, women can display higher levels of sociability compared to men. Furthermore, other research indicates that firstborns show traits often associated with masculinity—such as leadership, self-confidence, assertiveness, competitiveness, and aggression—irrespective of their gender. In contrast, laterborns are more likely to possess traits viewed as feminine, including affection, cooperativeness, and flexibility. Research has shown that higher levels of differences occur, especially when siblings are of the same gender (Daňková et al., 2024). Older studies observed that the most significant differences are found in the case of two male siblings. Similarly, other authors suggest that siblings of different genders experience much less rivalry and competition than those of the same gender. They argue, for instance, that societal expectations for distinct male and female roles contribute to this dynamic. It was posited that women with older brothers
- are, in a sense, treated as firstborns. Others added that in families with many siblings, the minority gender may enjoy a special status, a unique relationship with parents, and thus, access to resources. In some cultures, a gender preference exists (Chandna & Bhagowalia, 2024), that may result in women having more siblings. This can be associated with the negative effects of increased sibling numbers on academic achievement. Gender-related differences are more pronounced in less developed countries. For example, a firstborn son is more likely to be employed as a child, while a firstborn daughter has a higher chance of attending school. Higher parental investments in sons than daughters have also been observed. Considering an individual's position within the family in relation to their siblings and their genders is the foundation of Walter Toman's theory focused on partner compatibility. There is ongoing debate regarding the idea, on which gender has birth order greater impact. Regardless of the direction and strength of the effect, it is clear that siblings' gender, like their number, represents another critical variable to consider in analyses.
- **Stepsiblings:** The presence of stepsiblings or adopted siblings, particularly when integrated into the family from an early age, can significantly influence family dynamics and the perceived order of birth. Studies indicate a tendency among parents to favor biological offspring over stepchildren. Nevertheless, the body of research specifically addressing the impact of stepsiblings remains sparse, highlighting the imperative for more comprehensive investigations and hypothesis validation through the use of suitable data. Research exploring the consequences of birth order incorporates various methodologies, with some focusing on “full sibship” scenarios—comprising solely biological siblings—while others examine “mixed sibship,” which includes both biological and non-biological (step or adopted) siblings.
  - **Age Spacing:** Childhood development undergoes rapid changes, making even slight age gaps significant in shaping personality. The

level of rivalry among siblings is influenced by age spacing, with closer gaps leading to heightened competition, potentially exacerbated by shared peers. Small age gaps correlate with reduced parental investment, both financially and in terms of time spent tutoring or stimulating children (Powell & Steelman, 1990). Many scholars argue that smaller age gaps intensify the influence of birth order (Powell & Steelman, 1990; Zajonc, 1976). Studies have shown that larger age spacings are associated with richer vocabularies among siblings and better performance on mathematical or verbal tests. In relation to Adler's theories, it has been remarked that with an age spacing of over 5 years, the birth order effects weaken to the extent that a later-born child can exhibit various firstborn characteristics and be referred to as a "pseudofirstborn." However, the age spacing is often overlooked in studies, despite its recognized importance. Neglecting age spacing may introduce biases and lead to erroneous conclusions in birth order research. Despite criticisms of Zajonc's confluence model, age spacing remains a crucial factor that warrants further investigation (Karwath et al., 2014). Various methods for addressing age gaps, such as counting months or computing a family average, have been suggested. A special case of a small age gap is represented by twins, where, according to some authors, differences based on birth order can also be distinguished.

- **Health Issues:** Physical or psychological disabilities present in one of the siblings can notably alter the functional birth order within the family structure. These disabilities may lead to shifts in roles, responsibilities, and dynamics among siblings, thereby affecting their developmental trajectories and interpersonal relationships.

### Examples of Birth Order Effects Observed in Humans

In the field of personality traits, extensive research has been conducted, with numerous studies published. For the sake of clarity, the effects of

birth order have been divided into the following main areas: personality traits, selected mental health problems, academic abilities and relationships, and marriage area including sociosexuality.

#### Personality Traits

**Openness to Experience** Research indicates that firstborns generally exhibit lower levels of openness compared to laterborn individuals. This inclination towards conformity and tradition is supported by many studies, while others found conflicting findings by suggest a positive correlation between firstborn status and openness. Conversely, laterborn individuals tend to display higher levels of openness, attributed to reduced parental supervision and increased autonomy. Other studies corroborate this observation. Additionally, only children typically exhibit heightened openness due to greater parental attention and resources. Other research on conformity, considering gender differences, highlights variations in conformity levels based on birth order and gender.

**Conscientiousness** Firstborns tend to internalize parental values and assume caregiving responsibilities, leading to higher conscientiousness compared to laterborns. Conversely, laterborn individuals typically exhibit lower conscientiousness and achievement orientation. Only children often demonstrate heightened conscientiousness and are more goal-oriented. Moreover, firstborns tend to display a more adult-oriented approach to life, characterized by reduced impulsivity and greater rigidity compared to laterborns. They also exhibit higher self-esteem and a stronger motivation to meet parental expectations, particularly evident in their educational pursuits (Altus, 1966). It was reported that firstborns had a much lower rate of disagreement with their parents, contemplating a possible link to their higher obedience, discipline, and self-control. Characteristic traits associated with firstborn children include high motivation, leadership abilities, responsibility, conscientiousness, and a strong need for recognition and approval (Eckstein et al., 2010).

**Extraversion and Sociability** Firstborns tend to exhibit higher levels of dominance-related

behaviors, contributing to increased extraversion. Higher extraversion among firstborns compared to laterborns is corroborated by multiple studies, even though there are some contradictory reports. Furthermore, other research suggests that firstborns may not consistently demonstrate greater dominance in all aspects of extraversion. Conversely, laterborns, benefiting from increased peer interaction opportunities, typically display higher sociability and warmth compared to firstborns. These findings are supported by various studies. Moreover, laterborn individuals, particularly secondborns in two-child families, demonstrate higher levels of sociability and social success. Additionally, only children often exhibit elevated levels of extraversion compared to individuals with siblings. Their heightened sociability may stem from receiving undivided parental attention and the absence of sibling competition. A substantial number of studies have identified firstborns as more dominant compared to their laterborn counterparts, although there is some contrary evidence. Firstborn children are also most likely to participate in sibling bullying, often as aggressors. According to numerous other studies, firstborns typically exhibit a higher need for affiliation.

**Agreeableness** Firstborns often strive to regain favor by displaying self-sacrificing, obedient, and conciliatory behaviors. Laterborns tend to exhibit lower levels of agreeableness compared to firstborns. Regarding only children, findings on agreeableness are less consistent. While some research suggests slightly lower levels of agreeableness due to less experience with sibling interactions, other studies find no significant differences compared to individuals with siblings.

**Emotional Stability, Neuroticism, and Anxiety** Previous studies have suggested that firstborn individuals tend to have lower levels of neuroticism compared to those born later, such as secondborns, middleborn, youngest, or only children. However, more recent studies show a contrary trend, indicating that firstborns are often likely to have higher levels of neuroticism compared to other birth order types, suggesting a

possible change over time due to societal evolution. Moreover, some researchers reported that firstborns exhibit higher neuroticism compared to lastborns, while others found that firstborns show higher levels of neuroticism in comparison to only children. Studies also reported that only children exhibit lower levels of neuroticism compared to individuals with siblings. According to others, only children are less emotionally stable, less resistant to psychological stress, and more vulnerable than firstborns, indicating higher levels of neuroticism. This is corroborated by research finding that only children exhibit a lower capacity for self-control, which, according to some, suggests a higher degree of neuroticism. According to both self-reports and maternal assessments, firstborns are less impulsive compared to middleborn children from families of three. In agreement with the aforementioned effects, recent studies even show that firstborns tend to exhibit lower levels of various facets of the traits associated with emotional intelligence (Villanueva-Iglesias & García-Martín, 2023).

### **Academic Abilities**

Firstborn children often demonstrate superior intellectual abilities and higher education levels. The phenomenon is frequently attributed to increased parental attention and cognitive stimulation during early childhood. Psychological studies also suggest that differences in intellectual abilities and educational attainment by birth order can also be attributed to personality traits. Firstborns are supposed to be more often oriented toward adult values. They have a higher tendency to fulfill and identify with parental expectations, which may manifest, for example, in higher levels of obedience, self-control, and discipline.

They also demonstrate a greater need for recognition and appreciation, alongside a predisposition toward extroversion, problem-solving, methodical approaches to tasks or divergent thinking (Alabbasi et al., 2021). Furthermore, firstborns often prioritize future planning and career aspirations, showcasing intensive problem-solving skills and a strong motivation for learning (Carette et al., 2011). Recent studies have shown a positive correlation between the

degree of extroversion, in which usually firstborns score higher, and educational success. Some authors believe this may be related to the conscientiousness dimension.

The relationship between birth order and academic success is intricate, influenced by various factors including parental occupation and family size. While biological and genetic factors have been proposed to contribute to differences in academic performance, their extent of influence remains uncertain, and psychological and environmental factors are widely regarded as primary determinants of academic success concerning birth order (Black et al., 2011; Rodgers, 2001). Studies have shown positive correlations between intelligence and certain physical characteristics at birth, such as birth length and head size, albeit with variations across birth orders. However, some conflicting findings suggest that older maternal age may lead to lower birth weights, potentially influencing the academic performance of laterborns (however, there is some contradictory evidence reporting lower birth weights among firstborns).

The concept of a “rich uterine environment” for first-time mothers has been proposed, suggesting better uterine predispositions and maternal resources during the development of the first child. Conversely, laterborns may experience reduced maternal resources due to factors such as maternal age and depleted energy reserves. Moreover, studies have explored the impact of maternal physiology on cognitive abilities, with higher levels of certain types of maternal fat associated with improved cognitive outcomes in children. However, short intervals between births may deplete these reserves, potentially affecting laterborns’ academic performance. Additionally, the number of children in a family has been linked to the probability of genetic diseases and health problems, which could indirectly influence educational achievements.

A separate chapter comprises research on IQ. While a larger number of authors have already addressed the influence of birth order on achieved education, far fewer have studied its direct impact on IQ. The conducted studies yield ambiguous results. Some research has found higher IQ scores

among firstborn individuals. Black et al. (2011) identified a strong relationship between birth order and IQ with firstborn individuals having, on average, IQ scores 3 points higher compared to secondborn individuals. Sulloway refers to studies showing a less significant difference. For each decrease in birth order, there is a decrease in IQ by 1 point (Sulloway, 1997). Other authors also report a strong negative impact of higher birth order. Firstborn individuals also achieve better results when using Raven’s Progressive Matrices. Several other studies have found less pronounced (but still negative) effects of birth order. However, there are contradictory results reporting no relationship between birth order and IQ.

The assumption that firstborns are significantly more represented among gifted individuals led to the hypothesis that the more selective the school or university, the higher the proportion of firstborn graduates. Evidence from universities showed that the proportion of firstborns is usually indeed higher (Kuba et al., 2018).

### **Mental Health**

Birth order’s impact on mental health outcomes is a subject of ongoing scientific inquiry. Studies have challenged earlier notions, indicating that birth order may primarily affect health in younger age groups or immediately after birth.

Regarding pathological phenomena like schizophrenia, findings are mixed. While some studies suggest a correlation between birth order and schizophrenia risk, others find no significant association. Social factors, such as family size and sibling dynamics, may play a role in this complex relationship.

Research indicates a heightened propensity for addictive behavior among middleborns, aligning with the observed trend of riskier behavior among younger children. Notably, laterborn adolescents demonstrate a higher frequency of hospitalizations due to alcohol and drug intoxications. Various mechanisms underlie the influence of birth order on addictive behavior. Older siblings may intentionally introduce younger siblings to such behaviors, while younger siblings may imitate or model deviant behavior. Additionally, older

siblings may facilitate access to addictive substances. Different parenting styles also contribute significantly, with parental investment declining as birth order increases, resulting in reduced time and stricter discipline, particularly in larger families.

Birth order's association with Child Abuse and Neglect (CAN) syndrome varies across studies, with some indicating a positive correlation with later birth order. Although some findings are contradictory, there is evidence suggesting a higher prevalence of CAN traits among firstborns, explained by the increased pressure and expectations placed on them by parents. Factors such as ethnicity, socioeconomic status or dysfunctionality of family may influence outcomes. Results from another study however indicate that in families with two children, the second or younger child is subjected to physical punishment more frequently than the older one (moreover, in families with only one child, the overall rate of physical and verbal punishment is higher).

Regarding depression, research findings are mixed. While some studies indicate an increased risk among firstborns and only children, others fail to establish significant correlations, highlighting the complexity of factors involved.

Furthermore, studies suggest a direct association between increasing birth order and suicidal behavior, with laterborn or specifically middleborn individuals often being the most vulnerable (see e.g., Kirkcaldy et al., 2006), as risk factors for the development of suicidal behavior include lack of parental attention, bullying, presence of mental disorders, low level of education high number of children in the family, low level of father's education, father's absence, and increasing birth order.

Similarly, the frequency of self-harm monotonically increases with increasing birth order with the middleborn usually at higher risk. The study explains this effect by riskier lifestyles among younger children, which is consistent with the more frequent hospitalizations of laterborn children due to trauma and mental illnesses.

### **The Influence on Partnership Life and Sexuality**

There is evidence suggesting that birth order may influence marital and partnership dynamics and sexual-life-related traits, ranging from partner compatibility to homosexuality and sexual behavior.

The original work of Walter Toman introduces a comprehensive framework considering both birth order and gender, not as general constructs but as individualized factors shaping personal dynamics. Toman's emphasis on complementarity and the "duplication theorem" elucidates how individuals apply their lived experiences within familial contexts to subsequent partnerships, a theme explored further in the chapter on family constellation influences on marital and partnership life. Studies highlight the potential role of birth order in partner compatibility and relationship dynamics, suggesting that specific personality traits associated with birth order influence individuals' romantic interactions and complementarity with their partners. However, these theories and the associated research have received significant critical feedback due to often lacking evidence.

The influence of birth order on sexuality has been subject to empirical investigation, revealing distinct patterns in individuals' sexual behaviors and preferences with firstborn individuals tend to plan parenthood earlier, while laterborn individuals desire more diverse sexual experiences (Michalski & Shackelford, 2002).

Studies examining the correlation between birth order and risky sexual behavior consistently show a higher likelihood of such behavior among laterborn individuals compared to their older siblings. This inclination toward risk-taking diminishes with age, with age differences between siblings also playing a role, particularly concerning sexual activity during adolescence. Middleborn children, in particular, exhibit the highest risk propensity. Research suggests middleborn children exhibit lower propensity for infidelity compared to firstborns and lastborns (Salmon, 2003). Moreover, birth order has been associated with an increased risk of sexually

transmitted infections, particularly among middleborn individuals, attributed to their risk aversion and more liberal attitudes.

Furthermore, research has explored the connection between birth order and atypical sexual behaviors, such as paraphilias and sexual delinquency. A notable finding indicates a significant correlation between birth order and paraphilias, with laterborn children more likely to exhibit such behaviors. This association extends to sexual orientation, with homosexual and bisexual pedophiles tending to have later birth orders. Concurrently, paraphilias and sexual delinquency predominantly occur in individuals from large families, specifically they have a greater number of brothers than the general population. However, there are also contradictory results.

Limited evidence exists regarding the relationship between birth order and specific forms of sexual behavior, such as inclinations toward BDSM (bondage, discipline, dominance and submission, sadomasochism) practices. However, some sources suggest that correlations can be found even in these areas. For instance, there are reports of firstborn individuals showing significant and strong inclinations toward both dominant and submissive roles (Daňková et al., 2024).

The etiology of homosexuality remains complex, with many studies pointing to birth order as a potential factor. While findings are not definitive, research indicates a correlation between birth order and sexual orientation, particularly in males. Blanchard and Zucker (1994) noted higher birth orders among homosexual men, with older paternal age being a consistent factor. Other studies further supported this, showing increased number of older brothers among homosexual men. For thorough information regarding this topic, refer to the separate encyclopedic chapters on “Birth Order: Parental Manipulation Hypothesis” or “Birth Order: Sibling Manipulation Hypothesis.”

## Conclusion

In conclusion, since the mid-twentieth century, the study of birth order theory has uncovered

substantial insights into the distinct personality differences among only children, firstborns, and laterborn individuals. While significant findings have emerged, many research failed to find significant differences or criticize the methodology of studies. Furthermore, the observed effect appears often weak.

A comprehensive approach is vital, considering various factors that may influence trait manifestation or result in role reversals among siblings. Key among these factors is the need for a rigorous methodology to address the prevalent issue of inconsistent methodologies, which have contributed to inconclusive results in past studies. Moreover, a clearer delineation of birth order distinctions is essential to enhance comparability across studies. Additionally, the influence of various factors such as the age gap between siblings, gender representation in siblingship, and the presence of stepsiblings cannot be overlooked, as they may significantly impact the observed effects.

Furthermore, while sibling constellations have implications for various aspects of life, including sexual orientation, partner choice, and interpersonal dynamics, it's essential to adjust expectations regarding the strength of the birth order effect in certain domains. Additionally, the dominance of evidence from Western civilizations (and, in recent years, from Asia) highlights the need for more research representation from regions like Central or Eastern Europe, Africa, South America, etc., to ensure broader generalizability and relevance of results and conclusions.

Finally, societal evolution suggests potential changes in the influence of birth order on certain characteristics or even polarity change of the effects, emphasizing the importance of updated research to reflect shifting parental approaches and environmental conditions.

Considering these factors, it is clear that additional research and meta-analyses are required to enhance our comprehension of sibling configurations and their effects within a changing social context. Future studies should include more varied participant groups, utilize consistent research methods, and examine a broader array of determinants to offer a more thorough exploration of this fascinating subject.

## Cross-References

- ▶ [Birth Order: Parental Manipulation Hypothesis](#)
- ▶ [Birth Order: Sibling Manipulation Hypothesis](#)
- ▶ [Birth Order: Sociosexuality](#)
- ▶ [Fraternal Birth Order Effect \(FBOE\)](#)

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