The Roots of Radicalism

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Reviewed:
Born to Rebel: Birth Order, Family Dynamics, and Creative Lives
by Frank J. Sulloway
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1.

The case of the alleged Unabomber, Theodore Kaczynski, grips our imagination, not least as a psychological mystery of childhood development. Why might he have become a driven serial murderer? At first his curriculum vitae—child of liberal parents, Harvard College graduate, brilliant mathematician—might have seemed to point to another career. What was there in his genes or childhood environment that could have stamped him so powerfully?

Less attention has been paid to an even sharper paradox. Theodore's brother shared approximately half of his genes and grew up in seemingly the identical family environment. Yet one Kaczynski boy may have devoted himself to killing, while the other turned in his brother for a capital offense. There could hardly be a greater contrast between possible lawbreaking and law-abiding behavior. It would be difficult enough to explain such opposites within the same city and social group; how do we explain them in the same family? This is among the questions suggested by Frank Sulloway's study of siblings.

Polarization between siblings is something that any parent of more than one child witnesses dozens of times daily. For example, each day in the winter, when the heat is turned on in my house, my young sons engage in a battle that would be funny if they didn't take it so seriously, and if I didn't wonder about the possible effects of similar battles on the Kaczynski brothers. Before breakfast, both boys sit down to warm themselves on a floor heating grate with twenty-six slats. Each then counts whether his brother's body unfairly covers more than thirteen slats, and loud arguments begin. The polarization extends to all spheres of life: Joshua beats Max at chess, so Max stops playing chess for two years; Max acquires a pet snake, so Joshua demands his own personal pet snake, then announces a passion for butterflies; and, of course, each complains that the other is receiving more of their parents' attention.

Psychiatrists and psychologists have stressed the overwhelming formative influence of parents on children. In reality, many or most children spend far more time with siblings than with parents, whether at play, in laughing together, or in exchanging love, hate, and jealousy. Frank Sulloway's big book explores the effects of those sibling relationships, but it really consists of four books combined into one. It begins by asking why a few scientists, such as Darwin, contribute revolutionary creative advances, while other scientists with superior brains and opportunities fail to do so. It then

broadens its aim and explores the effects of family environment—especially of birth order, but also of other family variables—on the personality of anyone, not just of scientists. It turns to political and social revolutionaries and asks what molds them, from Robespierre to Fidel Castro. Through all these discussions runs the fourth theme: how to gain understanding in complex fields like psychology, biography, and history, where outcomes depend on many hard-to-quantify variables and on their interactions.

While a book about such difficult questions could easily degenerate into unreadability, Sulloway spices his pages with teasing problems and proposed solutions to them. What personal qualities enabled some of Henry VIII's many wives to escape the fate of beheading that befell the others? Why did Che Guevara and perhaps Theodore Kaczynski become revolutionaries, while their brothers did not? What makes some Supreme Court justices especially prone to issuing dissenting opinions? The book's last appendix is a worksheet enabling any reader to predict his/her own revolutionary tendencies at each of three different ages.

Siblings compete with each other. As children, we are exquisitely sensitive to perceived parental favoritism. That's obvious even in modern, well-to-do, first-world families, whose children have to compete for nothing more than love and toys. How much more desperate was the struggle in the past, when many or most infants didn't survive, and when the ability to compete with other siblings for limited parental resources (such as mother's milk, food, dowries, and inheritances) spelled out the difference between life and death, or between comfort and poverty! Human beings evolved through natural selection to overcome not only rare risks, such as attacks by saber-toothed cats, but also the daily and more serious hazards posed by siblings. If you find it difficult to acknowledge that fact, look at what goes on in any litter of puppies or nest of hatchling birds as a model.

Each child must develop his or her own strategy for cornering parental resources, because what works for one child doesn't necessarily work for another. Hence while children, already genetically different at birth but launched into the same family environment, are growing older, they become more rather than less different from each other. That divergence of ours is analogous to the divergent evolution, termed adaptive radiation, for which Darwin's finches are famous, some species evolving heavier bills to crack seeds, others finer bills to glean insects. But whereas related animal species can only diverge slowly, over many generations, by accumulating genetic changes, human children have to do it within a few years, by developing different personalities and ways of behaving, for the most part unconsciously.

One of the most potent factors impelling siblings to pursue different strategies is birth order. Whether you're older or younger than your sibling, hence temporarily stronger or weaker and more or less mature, has a big influence on what strategy could succeed for you. A newborn younger sibling is inevitably weaker and less smart than its older siblings for many years before it can catch up, if it ever does. Hence older children competing with younger siblings can often get their way by using their strength, bullying, asserting themselves, and dominating. Older siblings start out with

another big advantage as well: parents have already made a big investment in them by the time that the next sibling is born. In all traditional human societies as in animal societies, the firstborn is usually the parents' favorite, enjoying higher status. Who ever heard of a society where the youngest child customarily inherits the estate? It's no accident that inheritance, for kings and landed gentry as for commoners, has so often been by primogeniture. Under the conditions of scarce resources prevailing for most of the world's families, younger children serve as little more than a spare in case the oldest dies. That was the basis of the phrase used for Princess Diana's expected contribution to England and to Prince Charles: to present them with "an heir and a spare."

To overcome their disadvantage of a late start, younger children have to develop some strategy not based on brute strength. All of us who have been or have watched younger siblings know the alternatives, which include wheedling, developing social skills, appeasing or rebelling against older siblings, cultivating skills not already staked out by older siblings, and taking more risks. The latter tendency has a simple Darwinian explanation: if your chances of survival are lower, you have to take more risks.

These and other predicted differences between older and younger siblings are the subject of a large, somewhat inconclusive body of research by psychologists. Mr. Sulloway makes several useful contributions to sorting out the confusion. One is what is termed a meta-analysis: that is, using statistical methods to pool samples from different studies, and thereby to extract conclusions that each study individually fails to prove. For example, if you have a sample of only seventy teen-aged girls, that usually does not suffice to prove statistically even the uncontroversial acknowledged fact that eighteen-year-olds tend to be taller than fourteen-year-olds, but you can prove it with high probability if you pool 100 studies each of seventy teen-agers so as to have a sample of 7,000.

In this way, Mr. Sulloway tests, and for the most part confirms, a series of plausible hypotheses: that, compared to laterborn children, firstborns really do tend to be more concerned with achievement, more ambitious, angry, antagonistic, anxious, assertive, conventional, deferential to authority, dominating, identified with parents, jealous, and self-confident. At the same time they tend to be less empathetic, less willing to identify with the underdog, as well as less innovative and open to learning by experience, less rebellious, and less willing to take risks. As a result, firstborns are overrepresented among American presidents, British prime ministers, and participants in safe sports such as swimming and golf, while laterborns are overrepresented among sky divers and boxers.

If Mr. Sulloway were to stop there, any reader ought to howl in protest: But it isn't so simple! What of all the exceptions that come to mind? Of course it isn't so simple. Many other factors besides birth order affect personality. No more do all firstborns fit the stereotype of being jealous tyrants conscientiously following parental example than are all laterborns empathetic, rebellious race-car drivers. Personality can also be influenced by social class, age, and heritable features of temperament, as well as by

many features of the family constellation other than birth order. Hence Mr. Sulloway proceeds to test the effects of many of these factors on personality, through a series of comparative studies. Among his conclusions are the following:

Marked conflict with a parent tends to make firstborns more open to experience, converting them into "honorary laterborns," as exemplified by such firstborn innovators as Kepler, Newton, and Frederick the Great. Contrary to Freud's Oedipal theory emphasizing the importance of conflict with the parent of the same sex, conflict with either parent proves to have similar effects on personality. Differences between firstborns and laterborns are greater in families with more siblings. Siblings differing by three to five years in age tend to become most divergent (for instance, the laterborns are most receptive to innovation, firstborns most resistant) and tend to converge when they differ in age by under three or over five years. The death of a parent while children are young tends to increase sibling divergence in lower-class families, because the firstborn child may have to function as a replacement parent, but to decrease it in upper-class families, where the availability of surrogate parents permits orphaned siblings to unite. That proves, Sulloway writes, to be one of the few well-established effects of class on personality.

The effects of the gender of a child and its siblings on the child's personality are especially interesting. In the formation of so-called "masculine traits" (such as aggression, assertiveness, leadership, self-confidence) and "feminine traits" (being affectionate, cooperative, empathetic, flexible), a child's birth order turns out to have nearly as large an effect as its gender. In a two-child family consisting of an older sister and younger brother, the sister's personality is on the average more "masculine" than the brother's, which is as "feminine" as that of the younger sister of an older brother. Birth-order effects noted for personalities of men also apply to women, as is illustrated by Phyllis Schlafly and Anita Bryant, firstborn women defenders of the status quo.

Thus, considering all these factors other than birth order greatly improves predictions about personality and revolutionary tendencies. But it also lets one recognize as even stronger the effect of birth order itself, because birth order's effect interacts with that of the other variables, such as that of gender in the examples of the preceding paragraph. That is, the real effect of birth order is greater if it is considered in conjunction with other variables than if one considers it by itself.

2.

Mr. Sulloway was originally drawn to studying birth order by a question concerning scientific creativity: Why are some scientists much more open-minded to radical innovation than other scientists who have better brains and opportunities? For example, what was it about Charles Darwin—a poor student, one of six children of upper-class landed gentry parents, and a graduate of what was then a conservative establishment, Cambridge University, where he went to study to become a minister—that led him to

make the most radical advance in the history of biological thought? Why was Darwin the one to recognize evolution as a fact, when most other biologists of the day failed to reach the same conclusion? Darwin himself wondered about those questions:

I have been speculating last night what makes a man a discoverer of undiscovered things; and a most perplexing problem it is. Many men who are clever—much cleverer than the discoverers—never originate anything.... I have no great quickness of apprehension or wit which is so remarkable in some clever men, for instance Huxley.

Historians of science must not only ask who innovates but also who embraces or rejects someone else's innovation. As the evidence for a scientific discovery gradually becomes overwhelming, most scientists eventually accept it regardless of their personality. But when a discovery is first claimed, the evidence may be inadequate even for a theory that finally does prove correct, continental drift being a recent example: it was proposed in 1912, but not widely accepted until the late 1960s. At that early stage, acceptance or rejection of a novel theory virtually serves as a test of one's tendency to revolt or to conform. For example, I have a biologist friend whose penchant for embracing radical-sounding theories is especially transparent; he embraces even theories that he cannot possibly understand. What makes him and some others so eager to jump in whenever they sense a new view, right or wrong, battling with conventional beliefs?

To answer these questions, Mr. Sulloway has rated on a seven-point scale the views of 3,890 scientists who expressed support or rejection of twenty-eight significant scientific revolutions or innovations, ranging from Copernicus's heliocentric theory, through Darwin's theory of natural selection, Einstein's theory of relativity, and Freudian psychoanalysis, to continental drift. Birth order proves to be a major factor: laterborns are twice as likely as firstborns to favor a scientific revolution before its results are generally accepted. But just as with personality, that modest difference conceals bigger effects apparent on further analysis. Scientific revolutions, in Sulloway's survey, include radical ideological challenges to established religion and social values (e.g., the views of Copernicus and Darwin), theories with no ideological implications (such as glaciation), and reactionary theories lending ideological support to established values (e.g., eugenics). For radical theories, laterborns are five times more supportive than firstborns; for glaciation, birth order makes no difference; but firstborns are twice as supportive of reactionary theories as are laterborns.

Just as he did for personality, Mr. Sulloway examines the effect, on scientific radicalism, of many other factors besides birth order. That analysis provides new insight into why Darwin was the one to appreciate the fact of evolution, at a time when nearly all biologists were still convinced creationists. Darwin proves to have had an oversupply of factors destining him toward radicalism. He was lateborn (the fifth child) in a large family (six children), separated by a four-year gap from his next oldest sibling, affected by his mother's death when he was eight and by a troubled relationship with his father. Not only was he a youngest son, but he was the youngest son of a youngest son going back four generations, while his mother's father was the youngest of thirteen children. When all these factors are combined into a statistical model, one concludes

that Darwin (and also his great contemporary Alfred Russel Wallace, the independent co-discoverer of evolution, like Darwin the fifth of six children and four years younger than his next oldest sibling) was much more predisposed to become a radical innovator than most other contemporary biologists.

The Marxist view of history emphasizes the importance of class in molding social attitudes, for instance in breeding lower-class radicals who revolt against entrenched upper-class conservatives. But that perspective leaves unexplained the often stunning differences in attitudes between members of the same class, and even of the same family. Differences within a family are especially perplexing because of two undoubted facts that tend to produce convergence within families. First, father and mother tend to share social attitudes and political views, because agreement on those matters turns out to be one of the strongest predictors of who marries whom—much stronger than any bodily attribute related to sex appeal. In statistical language, the correlation coefficient between political views of spouses averages +0.9, where +1.0 would mean perfect agreement, 0 no relationship, and -1.0 complete disagreement. Second, the corresponding correlation coefficient for the views of parents and offspring is +0.47: not as high as that between spouses, but still indicating substantial agreement. Nevertheless, +0.47 still leaves room for plenty of disagreement among siblings, and between children and their parents.

To resolve these puzzles, Mr. Sulloway analyzes his usual huge database for effects of his usual large number of variables on political and religious attitudes. Class proves to have very little effect, but birth order has a large effect. Mr. Sulloway's complete panoply of variables (including birth order, class, and many others) has ten times the effect of birth order alone and 138 times the effect of class. All other things being equal, firstborns tend to be more conservative than laterborns, and older people more conservative than younger people—but many other things are often unequal.

As in other matters, firstborns conform more to their parents in social outlook, whether liberal or conservative, than do laterborns. Children whose birth order is the same as that of their parents conform more to their parents' views than do children differing in birth order from their parents. For example, while landowning nobles tend to be conservative, that is not, Sulloway argues, because they belong to the upper class (there have been innumerable upper-class radicals) but because of the compounding psychological effect of many generations of primogeniture. Landowning nobles tend to be the oldest child of an oldest child (who often chose another oldest child as spouse) going back many generations. For the converse phenomenon of a father and son at opposite poles in birth order and political views, consider the case of Benjamin Franklin, the fifteenth of seventeen siblings and the youngest son of a youngest son for five generations. While Franklin helped draft the Declaration of Independence at the age of seventy, his oldest son remained a Loyalist throughout the American Revolution, moved to England after the Revolution, and became completely estranged from his father as a result of their political differences.

Because birth order, in its effect on political views, interacts with many other variables that collectively have a much larger effect than does birth order alone, one should not be surprised to find firstborns as well as laterborns among famous revolutionaries. However, Sulloway writes, there are differences between the styles of firstborn and laterborn revolutionaries. Consistent with other aspects of their personalities, firstborns, who as children may be in a position to behave as uncompromising terrorists toward their younger siblings, tend to carry that tendency over to their revolutionary strategies as politically active adults. The long list of revolutionary terrorists who had law-abiding younger siblings includes Robespierre, Carlos the Jackal, Mussolini, Che Guevara—and, allegedly, Theodore Kaczynski.

Mr. Sulloway illustrates these conclusions with large-scale analyses of participants in the Protestant Reformation and also in the French Revolution, once considered the classic Marxist example of class struggle. For instance, he tabulates the votes, birth order, and personality characteristics of all 893 deputies of the National Convention at the height of the French Revolution's Terror. Mr. Sulloway's readers won't be surprised to learn that, at the crucial vote on whether to pardon or execute King Louis XVI, 73 percent of the firstborn deputies voted tough-mindedly for execution, while 62 percent of the laterborns voted for pardon as a compromise. Of course, that leaves 27 percent of firstborns and 38 percent of laterborns whose votes are not explained by birth order. But, here as elsewhere, Mr. Sulloway considers birth order merely as the most influential among many variables, of which he tests seven for their relation to the vote on execution vs. pardoning.

Such differences between the political views of firstborns and laterborns carry over into smaller databases as well. Among the items that Mr. Sulloway cites, 96 percent of Reformation Protestant martyrs in Catholic countries were laterborns, but only 33 percent of Catholic martyrs in Reformation Protestant countries. Recent Republican presidents have tended to appoint firstborns as Supreme Court justices, while Democratic presidents appoint laterborns. Firstborn justices, formed by a childhood of obeying their parents, issue significantly fewer dissenting opinions than do laterborn justices. Among King Henry VIII's six marriages, the happiest was to firstborn Catherine Parr (she obeyed him), while the two ending in beheadings were to laterborns Anne Boleyn and Catherine Howard (they made the mistake of defying him).

I said earlier that Mr. Sulloway's book really consists of four books rolled into one. Three of those sub-books deal with family influences on personality, scientific creativity, and political revolutionary tendencies, as I have been discussing. The last sub-book treats a still broader theme: how to pursue studies of human behavior scientifically.

There is, of course, already a gigantic literature on each of Mr. Sulloway's first three themes. Most of it, however, belongs to the humanities or to the discipline of history rather than to the sciences. I don't say this to denigrate that literature, but simply as an observed fact about methodology. Indeed, there are obvious reasons why authors shy away from pursuing these themes by the methods of science. The creativity of even a single individual, even one person's personality, the origins of even a single

revolution, are overwhelmingly complex problems. Each is influenced by a myriad of variables, many of them apparently unique to that person or revolution. If we have such difficulty understanding a single example, what could be more daunting than to aspire to a comparative study of 893 examples? Instead, the traditional form for treatments of these three problems is the case study: a psychoanalytical case study of one person, a biography of one scientist, a history of one revolution. Only after we have understood many individual examples can we hope to generalize—or so it might seem.

But the case study method, as it is usually pursued, suffers from a crippling drawback. It does not apply "scientific methods"—a phrase that makes non-scientists uneasy, but that really means nothing more than is implied by its Latin root, *scientia* (knowledge): methods useful for extracting knowledge, and for curbing one's tendencies to stamp one's pre-existing interpretations on data as they accumulate. The scientific method involves viewing each particular problem within a broad context of related problems, posing and testing competing hypotheses, defining dependent and independent variables, measuring them, making predictions about their relations, and testing those predictions, preferably with statistical measures of significance. The absence of this methodology means that biographies, histories, and psychoanalytical case studies run the risk of becoming Rohrschach tests in which the author interprets the data according to his or her pre-existing view. One has only to compare two biographies of the same person by different authors (e.g., those of Bismarck by A.J.P. Taylor and by Ludwig Reiners), or accounts of the same historical event by different authors, to appreciate this dilemma.

Those who are tempted to write off scientific methodology as inapplicable to complex problems of human behavior might reflect on its routine application to other complex problems universally subsumed under fields of science. For example, how many species of plants or animals does one expect to find on an island? It depends on a host of variables and their interactions, such as the area, elevation, geological history, habitat diversity, isolation, and productivity of the island, and the body size, fecundity, life span, overwater dispersal ability, and population density of the plants and animals involved. Yet island bio-geographers manage to define and measure these variables, to use them to test competing hypotheses, and thereby to predict with considerable accuracy an island's number of species, as well as to measure the effect of each factor far more convincingly than if one attempted to detect its effect by itself.

While Mr. Sulloway does not explicitly draw an analogy to the science of island biogeography, he does explicitly defend the same rationale in his studies of human personality. When one analyzes anything as complex as islands or humans, one cannot reasonably expect a single explanatory factor to explain much. Instead, one must be prepared to deal with large numbers of variables and their interactions. Faced with this dilemma, most biographers and historians don't even try to apply scientific methods. To me, Mr. Sulloway's most basic contribution is to show that they can indeed be applied profitably, even to biographies and histories. For instance, his family-dynamics

model of radical scientific thinking employs eight variables about the scientist, seven interaction effects between those variables, and another variable about the scientific revolution itself. It thereby succeeds in correctly classifying two thirds of all scientists, and 89 percent of scientists from extreme family backgrounds, concerning their attitudes towards a scientific revolution.

Even if one's interest is in understanding a single scientist, patient, or political revolution, this method has the advantage of setting the case within a broad context, and thereby permitting one to recognize what (if anything) is truly idiosyncratic about the case under study. For example, psychoanalysis has attracted numerous women noted for their challenges to Sigmund Freud's views, including Helene Deutsch, Karen Horney, and Melanie Klein, all of them lastborn (among their four, two, and four siblings respectively). It seems at first paradoxical that the equally distinguished and able Anna Freud was much more conservative, even though she was the youngest of Freud's six children and for that reason even more predisposed to rebel. But we now know that she was psychoanalyzed by her father—not a variable coded in Mr. Sulloway's formulas, but nevertheless a potent, idiosyncratic way to reduce "resistance" to her father's theories. Mr. Sulloway devotes an entire chapter of his book to such idiosyncratic "exceptions to the rules."

Where will Mr. Sulloway's book lead? The bane of an author who has just written a big book is a reviewer who wishes the author had instead written a somewhat different big book. Slipping into that expected role, I note that most of the twenty-eight scientific revolutions analyzed by Mr. Sulloway took place in the nineteenth century or earlier, and that only one of his twenty-eight analyses—of continental drift—extends beyond the year 1950. I wish that he had also analyzed recent scientific controversies. Since many of the people who took part in them are still alive, I would have thought that it would therefore be possible to determine attitudes and family variables much more accurately for them than for long-dead scientists. For instance, a current battle among biologists involves a theory of biological taxonomy, termed cladism, which was promulgated in the 1950s and which classifies plants and animals on the basis of their evolutionary relationships alone. Its early advocates behaved with revolutionary zeal and denounced classical taxonomists, until cladism became widely accepted and its advocates more sedate. Did early cladists tend to be laterborns, and did the classical taxonomists whom they denounced tend to be firstborns? Analysis of the membership list of the Willi Hennig Society (a society devoted to cladism and named after its founder), with the years of joining, should be instructive.

Another possible extension, to which Mr. Sulloway himself devotes a page of exploration in an appendix, would be to Nobel Prizes, which in the popular mind are virtually synonymous with scientific revolutions. Molecular biologists who turn to biographies of Nobel laureates James Watson, Francis Crick, and Linus Pauling, the contestants in the famous race to solve the structure of DNA, in order to learn their birth orders will be surprised to discover that all three were firstborns, seeming exceptions to Mr. Sulloway's generalization about revolutionary tendencies of laterborns.

Here, as elsewhere, we can raise the question whether some of Mr. Sulloway's many variables other than birth order will prove important. And we might consider as well that, in reality, many or most Nobel Prizes are not awarded for scientific revolutions but for the reverse: clever problem-solving within an established frame. Do ambitious little firstborn tyrants who bully their younger siblings, obey their parents, and study diligently at school thereby increase their likelihood of becoming represented among Nobel laureates? This would be a promising question for a researcher who wants to carry forward Mr. Sulloway's fascinating and convincing work.

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