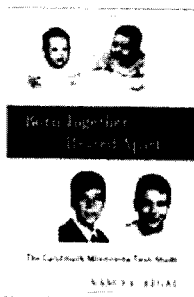


## Blame It on Darwin and His Cousin!

A review of



**Born Together—Reared Apart: The Landmark Minnesota Twin Study**

by Nancy L. Segal

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Reviewed by

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The idea of using twins to sort out the relative contributions of nature and nurture first appeared in an article by Francis Galton (1875). Galton had been fascinated by the publication of *On the Origin of Species* (1859) by his half-cousin, Charles Darwin. Although Darwin spent little space in that volume on the human implications of his work, Galton seemed to understand them immediately. In fact, Galton spent the rest of his life working them out.

Galton was particularly interested in intelligence and in his cousin's emphasis on *variation*, what psychologists today usually call "individual differences." He used the phrase "nature and nurture" (he called it a "jingle of words") to describe the contributions of heredity and environment to various psychological phenomena. He reasoned that studying twins might be a way to sort out their relative contributions. After conducting a survey of

twins and their relatives, he was convinced of the usefulness of the method. And so the twin studies began.

*Born Together—Reared Apart: The Landmark Minnesota Twin Study* presents the history of the Minnesota Study of Twins Reared Apart, known as MISTRA, one of the most comprehensive of all the twin studies. The study ran between March 1979 and March 1999. In all, it involved 137 twin pairs, both monozygotic (identical one-egg twins) and dizygotic (two-egg) twins: the former being genetically identical, the latter being as identical as siblings. Blood tests were used to determine the type of twin. It was estimated that during testing and evaluation, 15,000 different questions were asked of the twins.

The book's author, Nancy Segal, was actively involved with the study for nine years from 1982 to 1991, first as a postdoctoral fellow and later as the assistant director of the Minnesota Center for Twin and Adoption Research. She is currently a professor at California State University, Fullerton, and the director of the Twins Studies Center there. She has written extensively on twins, including two previous books (Segal, 1999, 2011). To top it off, she is a twin herself. One could certainly argue that she has all the necessary credentials to write this history.

The director of the study, Thomas J. Bouchard Jr., was originally trained as an industrial/organizational psychologist, and his involvement in the study came about almost by accident. The study began with the discovery of a set of identical twins, Jim Lewis and Jim Springer, referred to as "the Jim twins," who had been separated at four weeks and reunited at age 39. The list of things that they had in common was strikingly similar, from their most hated school subjects to their favorite vacation spot, and their stories became a subject of great public interest.

Bouchard leaped at the opportunity to study the twins before they became "contaminated" with recent shared experiences. Although it occurred to him that he could study other pairs, the likelihood that he would be able to locate many struck him as remote. But he didn't factor in the publicity raised by the twins that were already discovered. Strangers began to write him of other such pairs. He soon realized that stories about his twins and their similarities could be a very useful and inexpensive recruiting tool.

The number and range of variables that Bouchard and company examined over the period of the study are dazzling. Two of the chapter titles give some of the flavor of the range of variables: "Sexual Orientation, Cognition, and Medical Traits" and "Dental Traits, Allergies, and Vocational Interests." (The pairing of *psychopathology* and *religiosity* in the title of another chapter was apparently simply convenient and not meant as commentary.) And the list goes much beyond that. The choice of rich and varied topics undoubtedly came about as a result of the flexibility of the study's leaders. Several topics became part of the study when a colleague made a random remark about this or that possibility, or when a student expressed an interest in some particular variable. Bouchard was very flexible when it came to collaboration.

It is difficult to try to summarize a study with such a wide scope. Overall, the comparisons of the various twin sets were impressive in displaying the importance of genetic effects. Although this volume downplays an anecdotal approach to the study, several of the cases almost demand a mention. One case is of identical triplets reared apart who all met the criteria for Tourette's syndrome, a disorder from which their biological father also suffered; none of the triplets was raised by the father or with each other. In a very different realm, the researchers were surprised to find genetic effects associated with variables such as religiosity, a variable that has been traditionally more associated with parental influences. Other social variables emerged with similar genetic effects.

The study also highlights an approach to the nature/nurture question that has generated recent interest. Almost everyone agrees that nature and nurture interact to generate behavior, but how is that interaction to be understood? Contemporary behavioral geneticists argue—as does Bouchard and company—that the genetic blueprint is likely to have an important role in determining (that is, in the choice of) the environment within which a person will operate. Our nature is not simply a passive part of ourselves waiting to be expressed. Instead, it may play an active role in determining our nurture, for instance, by underlying why we choose a specific environment in which to operate, whether that environment is an assembly line or a graduate school.

The implications of the study are considerable. If genes play a major role in behavior, how effective is intervention in changing the behavior? How important are parents in providing a nurturing environment for a growing child? Is it possible that parents are not as responsible for their children's behavior as they think they are? Dozens of comparisons show that the home environment appears to have a negligible effect on many behaviors. This may be a difficult lesson for caregivers to accept. A related and surprising result indicates that environments outside of the home can play a more important role in certain behaviors than might genetic effects.

There are a number of loose threads in the study. For example, some sets of twins had early contact with one another; other sets, virtually none. Of course, no study of real-life people is ever going to be completely methodologically clean. Segal addresses many of the objections that have been raised about the study, some of them in great detail.

Not surprisingly, a number of the comparisons suffer from small sample sizes, for instance, in the comparisons of sexual orientation or alcoholism. The researchers are candid about the limitations of the study. Segal points out a number of instances in which identical twins reared apart were significantly divergent in their behaviors. Such revelations on the part of Segal suggest a certain evenhandedness as a writer, which, in turn, serves to underscore the credibility of her emphasis on the power of genes. Segal also gives us a look behind the scenes on a number of occasions, a good way for students and young scientists to learn that science does not always proceed in logical and linear ways. Often there are hunches, happenstances, and simple accidents that figure into the mix.

For all the work that went into this volume, it is difficult to know the audience whom the author intended to address. The presentation contains some expositions that would be quite basic to any social scientist: for example, a rather extensive section on the meaning of correlation coefficients. At the same time, the volume is often densely written, with the amount of scientific detail more than what the typical "civilian" would be interested in. Some of the tables require a level of sophistication that I suspect is also beyond many nonprofessionals. Moreover, Segal makes it a point to discuss related studies, not only the ones that fall under MISTRA. The result is as comprehensive a volume on psychological studies of twins as one is likely to find.

On the final page of her book, Segal quotes Bouchard, the principal investigator of MISTRA. It is a useful summary of the results of the twin studies, and so I will give him the final word: "Twin studies . . . refute both biological and environmental determinism. They do not negate the effect of the environment on behavior, nor do they overglorify the role of genes. They account for the uniqueness of each of us" (Bouchard, 1997, p. 57).

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