

BOOK REVIEW

Born Together—Reared Apart

Nancy L. Segal (2012), Harvard University Press. 416 pp. ISBN 9780674055469

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The Nature-Nurture (N-N) dichotomy has been argued for many years. Is it upbringing and rearing, with all its different experiential manifestations, that determines how an individual will react and behave, or is it something in one's genes and biological heritage? Actually, it is currently accepted that both nature and nurture together are involved, and entwined, in structuring behavior. The debate now seems more focused on which has the greater influence, and by how much, with reference to specific traits. (The underlying molecular genetic base of human traits is also at the forefront of behavioral genetic research, as is the study of epigenetics.) The arguments on both sides seem to have great persistence among their advocates. The material and stories offered in this book will probably not stop the arguing, but they certainly should go a long way in forcing the adherents of the nurture side of the debate to rethink their arguments, while encouraging those proponents of nature.

Dr Segal obtained her doctorate in psychology at the University of Chicago under Professor Daniel G. Freedman. She then went on to the University of Minnesota to become associated with that university's MISTRA project under the mentorship of Dr Thomas J. Bouchard, Jr. Bouchard is best known for his research as Director of MISTRA (Minnesota Study of Twins Reared Apart). These twin types are professionally known as MZA for monozygous (genetically identical) twins reared apart and DZA for dizygous (genetically non-identical) twins reared apart. Such twins are in distinction from twins that have been reared together for most of their development to maturity, MZT and DZT. This difference makes MZA and DZA twins unique. When compared with twins reared together, it makes twins reared apart ideal as tools by which the interplay of N-N can be examined. These twins reared apart, when compared with twins reared together, allow for evaluation of the influence

of forces such as parental involvement, rearing practices and nutritional and other environmental social factors, and allows comparison with inherent genetic influences.

After obtaining her degree, Dr Segal maintained her association with the MISTRA study for 9 years. She was a postdoctoral fellow with the study for 3 years, and then for 6 years was Assistant Director of the Minnesota Center for Twin and Adoption Research, involved in recruiting and testing twins of all categories. This exposure gave her a special opportunity to be involved, for an extensive period, in the fascinating area of twin studies, and record the history of the MISTRA program. Segal is, herself, a fraternal twin.

This is Segal's fourth major book about twins. Her three previous books, *Entwined Lives: What They Tell Us About Human Behavior*, *Indivisible by Two: Lives of Extraordinary Twins*, and *Someone Else's Twin: The True Stories of Twins Switched at Birth*, are in many ways quite different from the current one. Those books gathered strength from the storytelling nature of Segal's presentations and the interesting lives of the twins. The anecdotes and case presentations about the twins made for interesting reading that most readers could appreciate. In the current book the focus is more on an historic review of the MISTRA investigations. There is extended discussion of the study findings and the trials and tribulations associated with them. The reports of the studies are often accompanied by statistical analysis of the results and the significance of such. In many ways this makes the book of greater interest to professional readers and academics than to a lay audience. In either regard, it is an important book because many of the study's findings were serious contributions to our bed of knowledge and the book explains why.

Many of the findings from the MISTRA program were new. But, many of the most important findings were those

that confirmed previously reported ones considered controversial or on weak ground. In the area of IQ research, for example, the study comparing twins reared apart with those reared together confirmed the strong genetic effect found by other researchers before and countered the objection of many doubters. The former findings of IQ had been considered controversial or biased by even well-established scholars. James Watson, for example, felt environmental and rearing practices most important for developmental capabilities like IQ. And the strong effect of genetics on IQ, accounting for 80% of the variance, as reported by Arthur Jensen, was doubted because he had been accused of racial bias.

As an historic review, Segal recounts both the successes and the problems encountered by the MISTRA program. Many investigators that depended on, or still depend on external grants for their research, will find these accounts revealing and perhaps all too familiar. There were often critics suspicious of the use toward which the results would be applied. Would any results found be discriminatory, as others seemed to have been before? Funding agencies were reluctant to back a study that they thought would not be able to provide a sufficient number of twins to yield significant data. (I myself experienced this when I was attempting to follow up the case of John/Joan; an *N* of one.) From the book we learn that Bouchard himself was prepared to draw funds from his own pocket to support the research. Aspects of such grant-associated problems make for engrossing reading.

The book is not, however, an easy read or page-turner. It is replete with detail, data, statistics, and historical minutia. It is, nevertheless, an important read for any one seriously interested in genetics or the N-N debate. With detailed recounting of how evidence was gathered, the book reviews how research from MISTRA studies showed nature to significantly outdistance nurture in organizing such medical characteristics as cardiac and dental conditions, allergies, and neurological problems like Tourette syndrome. While many can easily accept such biological findings for biological conditions, MISTRA research also found nature of great influence with characteristics such as personal traits most often thought the product of upbringing and parental influence. MISTRA research found job satisfaction, sexual orientation and religiosity all more than anticipated genetic influence. 'A twin-family analysis confirmed heritability of about 50% for traditionalism [in intensity of religious belief] as well as showing high heritability for sexual and religious attitudes.' Mental conditions and sexual orientation too were found to be genetically influenced. Indeed, as Segal relates, MISTRA studies found, regarding adult personality, 'the rearing home environment had little effect' and factors such as vocations and occupational interests were also substantially guided by genetic potentials. They quote the findings of Robert Plomin and David Rowe in saying: 'While not denying the importance of parenting, [we found] that parents were less responsible for their children's behavior than they thought.'

Details about many of the twins discussed were fascinating to me and provide the more interesting reading in the book. However, these details are unfortunately presented in different sections of the book to illustrate different points, rather than grouped together.

Consider these details of the so-called 'Jim twins' and figure the odds that such occurs by chance. Two persons, separated at 4 weeks of age and not meeting until after 39 years of separation, had both married women named Linda first and then Betty. One had a son named James Allen while the other named his son James Alan. Both had dogs named Toy and both smoked Salem cigarettes, both had carpentry shops in their garage and both had math as their favorite subject and spelling as their worst. Statistically the possibility that this all happened by chance would be less than that of winning a major lottery!

Another interesting set of MZA twins was Oskar and Jack. One was raised as a Catholic in a Nazi home in Germany while the other was raised as a Jew in Trinidad. They met briefly in Germany at the age of 21, but only at the age of 47 did they meet for any considerable length of time when they appeared to participate in the MISTRA research program. Jack was raised by his father and his grandmother raised Oskar. When the twins appeared at the Minneapolis International Airport they were both wearing blue shirts with epaulettes and wire-rimmed glasses. They wore similarly shaped moustaches. Testing of their personality by the MMPI, the Minnesota Multiphasic Personality Inventory, 'revealed personality profiles that matched almost perfectly'. (The MMPI is one of the most frequently used personality tests in mental health used to assist in identifying personality structure and psychopathology.)

A third set of twins I found engaging were Mark and Jerry, the 'fireman twins'. They were so called because both had spent their available time as volunteer fireman, drank Budweiser beer and supported their stein or beer can by placing a pinky finger underneath. They were also both ardent football fans (although to different teams), both installed electrical equipment, and both considered themselves non-religious Jews.

The dominant finding from the sum of the MISTRA efforts basically was that identical twin individuals meeting as adults are more behaviorally alike than unrelated individuals raised together. Research also shows that unrelated individuals raised together become *less* alike in intelligence over time. A consistent result from the MISTRA analyses was that features of the twins' rearing homes made negligible contributions to their behavioral resemblance. This point was often lost in some of the harsh media treatments of the MISTRA.

Before going further, I should make it clear that nowhere does Segal imply that the MISTRA study uncovered genes for women named Linda being married first and then Betty, genes for blue shirts with epaulettes and wire-rimmed glasses, or preference for spending time as volunteer

fireman and how to place a pinky while drinking. She and Bouchard explain it as '*active-genotype environment correlation*', which holds that innate, genetically biased tendencies work to mold the environment to best manipulate any situation, and it is the similarity in resolution that is intriguing. Bouchard is quoted in this regard: 'Genes drive behavior and . . . behavior determines the environment we experience'; and 'Nature writes the score. Environment is responsible for the playing technique'. I, personally, find this explanation satisfying in melding with my own theory of 'biased-interaction' working to organize gender identity. I hold that there exists, in each individual, a genetic-

endocrine induced bias toward a male or female gender, that interacts with the environment to structure behavior.

Some last comments: A feature of the book I found very commendable and useful was the excellent set of endnotes conveniently arranged for reference; also of value is a quite usable index. If you are a professional associated with genetics you will find this book of interest and of value. For those engaged in the nature-nurture debate it may be crucial in understanding what traits may be more influenced by nature and which by nurture, and for the layperson it will be of interest for the anecdotes about the twins themselves and how a major study evolved and fared.