

HD. Future research may find an answer to this critical issue and may provide more clues toward the development of therapy for HD. Overall, the third edition of *Huntington's Disease* provides the latest knowledge of HD and is extremely useful to the general reader; to students of human genetics, neuroscience, and neurobiology; and, of course, to clinicians and basic researchers.

P. HEMACHANDRA REDDY

Oregon Health & Science University
Beaverton, OR

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Entwined Lives: Twins and What They Tell Us about Human Behavior, by Nancy Segal. New York: Plume, 2000. Pp. 396. \$16 paperback, \$27.95 hardcover.

As a human geneticist, I thought I knew a fair bit about twins, but I learned a lot more from this book, written by the director of the Twin Studies Center at California State University, Fullerton. The author's goal is "to bring twins and twin studies to life for the millions of people who will be more enriched, informed, and enlightened by the messages they hold."

As its subtitle suggests, the book deals mainly with intelligence and personality. It reviews the many studies that use the classical Galtonian approach of comparing MZ and DZ twin pairs raised together and apart. The consensus of these is that virtually everything examined shows some evidence of genetic influence. Intelligence and many of its subcomponents show high heritabilities, whereas estimates for personality traits tend to be lower, though always positive. Some summaries of the scientific findings in tables would have been useful.

But there are other kinds of twin comparison. Dr. Segal reviews the much-less-voluminous body of data from studies designed to get more of a handle on the environmental factors. There are "pseudotwins"—unrelated siblings (an oxymoron?) reared together of the same age, or UST-SAs. Their IQ scores are much less similar than those of MZ twins, DZ twins, and siblings, providing an estimate of how much (or little) the shared environment contributes to the similarity of people living together—one component of the heritability formula.

Studies of unlike-sexed versus like-sexed DZ twins are providing (somewhat conflicting) evidence of the effects of intra-uterine exposure to hormones. Dr. Segal tells of superfecundated twins and children from eggs ovulated together but gestated separately (twibs?), which would provide other estimates of environmental effects, if enough twins could be evaluated.

Other aspects of twins and twinning that this book deals with include the "epidemic" of twinning resulting from assisted reproduction, twinning in nonhuman animals, conjoined twins, and clones.

Then there is the sociology of twinning. How do twins—and their families—feel about each other? Does a twin grieve more, or differently, for a lost cotwin than for a sib? Does the special bonding between twins have legal implications? There is a chapter on twin pairs who are outstanding academically (10 pages on the Shapiro twin university presidents), artistically, or athletically and a chapter on the heritability of athletic ability.

Interspersed with the scientific aspects of twin research are voluminous personal details—the life stories of selected twin pairs, reminiscences of Dr. Segal's conversations with them and their families, and personal revelations of her feelings about her own (DZ) twinship.

As the author points out, whereas classical twin studies estimate how much of our variation is due to genetic and how much to environmental factors, they do not identify these factors. They only tell us where to look. Analysis of environmental differences in discordant MZ pairs might identify causal factors, but this approach has not yielded much.

Dr. Segal suggests several new places to look, which (if one looks hard) may reveal implications for "our views of ourselves, our relationships with family members, our methods for raising children and our outlook on human potentials and possibilities."

The book should be a useful reference for geneticists, psychologists, and sociologists interested in the heritability of mental differences or in twinning itself. It should appeal particularly to members of the general public with a personal interest in twins—and who doesn't have one?

F. CLARKE FRASER

Department of Human Genetics
McGill University
Montreal

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