

Book review

Genes, Brain Function, and Behavior

Douglas Wahlsten

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Behavior genetics is a mature field of inquiry with a long history going back to the early 20th century; nevertheless there is a lack of good textbooks suitable for undergraduate or graduate courses. The iconic *Behavior Genetics* by John Fuller and Robert Thompson, published in 1960¹, provided an overview of what had been accomplished in the field up till then and is commonly regarded as the beginning of behavior genetics as a separate field. The book was updated almost 20 years later in 1978², but by now even this monumental work is more than 40-years-old and severely outdated. The most successful behavior genetics textbook to date, written by Jerry McClearn and John DeFries, was first published in 1973³ and the thoroughly revised 1980 version⁴ went through several updated editions of which the 7th was published just a few years ago, in 2017⁵. Originally this book was heavily oriented towards twin and adoption studies and variance-partitioning and quantitative-genetic methods, but although recent editions have paid more attention to such subjects as psychiatric genetics or gene localization, the brain as the intermediary between gene action and behavior is only briefly mentioned. However, since the days of Fuller and Thompson, the field has expanded much and in the last several decades has more and more been merging with the field of neurogenetics (*Genes, Brain and Behavior* itself being one result of this development).

Given this history, it is clear that a comprehensive textbook, integrating behavioral science with genetics and neuroscience, is urgently needed. The present volume, *Genes, Brain Function, and Behavior* by Douglas Wahlsten fills this need in an admirable way. It is, to the best of my knowledge, the first neurobehavioral genetics

textbook that puts *causation* at its center. Unlike much of contemporary human behavior genetics, it addresses not just the fact that genes influence behavior, but pays adequate attention to the neurophysiological processes underlying *how* genes influence behavior.

The book is well-produced and has many informative illustrations. These are in black-and-white, but the book comes with a dedicated website where for each chapter a PowerPoint file can be downloaded containing complete ready-to-use lectures, including full-color versions of the illustrations.

After introductory chapters treating the fundamentals of gene action, the nervous system, and behavior, a number of chapters follow that present several disorders caused by single genes or chromosomal anomalies, such as phenylketonuria and Down Syndrome. The chapter on the XYY male is fascinating reading, showing in eloquent detail how preconceived notions can lead researchers astray in interpreting their data. Complex traits such as autism or schizophrenia are not forgotten and the book does not hesitate to address hot topics like the genetics of intelligence, issues of sexuality and gender, or race.

The book presents a coherent overview of the field, presented with impeccable logic and lucidly written. The contrast with other available textbooks on human behavior genetics is great: not only is there a strong emphasis on neurophysiological mechanisms, but estimating heritability and other variance-partitioning methods are only treated briefly, while making a strong case that these methods do not necessarily lead to new insights into the causation of the behaviors or disorders that they are applied to. The only thing left to desire is a companion volume on animal research.

From the foregoing it will be clear that I was very favorably impressed with this book. Anybody who teaches a class on neurobehavioral genetics should have at least one copy of this book, as should anybody with even an in-passing interest in this field.

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