

## Irving I. Gottesman, PhD (1930–2016): In Memoriam—Introduction to the Special Section

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With the death of Irving I. Gottesman, Ph.D., on June 29, 2016, at his home in Minnesota, the fields of clinical psychology, psychiatry, and behavior genetics lost a pioneer and brilliant scholar, not to mention a beloved colleague. In this Special Section of *Clinical Psychological Science*, we pay homage to his inestimable contributions to clinical psychological science.

Born in Cleveland, Ohio, on December 29, 1930, of Hungarian immigrant parents, “Irv,” as all of whom knew him affectionately referred to him, graduated with a degree in psychology from the Illinois Institute of Technology in Chicago in 1953, after which he served as a U.S. Navy communications officer in Korea. Upon his return to the United States, Irv began his graduate studies in clinical psychology at the University of Minnesota, working with his advisor R. D. Wirt and with S. C. Reed of the Dight Institute of Human Genetics, graduating with his PhD in 1960.

His doctoral dissertation (Gottesman, 1963) was one of the earliest twin studies of personality (assessed with the Minnesota Multiphasic Personality Inventory, MMPI, of course) and set a standard for methodological rigor, careful analysis, and sophisticated interpretation. It was also notable for being an extremely bold move for a young psychologist at a time in the 1950s and 1960s when the study of genetic influences on human behavior was viewed by most as anathema.

Irv’s first academic position followed as a lecturer in psychology at Harvard University, from which he left in 1963–1964 to pursue research in psychiatric genetics as a special fellow at the University of London’s Institute of Psychiatry, Medical Research Council Psychiatric Genetics Unit directed by Eliot Slater, MD. It was there that Irv began work, with his close colleague, James Shields, on the landmark Maudsley twin study of schizophrenia (Gottesman & Shields, 1972), which discovered important

genetic influences on schizophrenia along with environmental effects that were not shared between co-twins. Along with its methodological, conceptual, and clinical sophistication, this twin study was again remarkable for its courage at a time when much of psychology and psychiatry considered schizophrenia to be caused environmentally by “schizophrenogenic” mothering and “double-bind” communications.

It was also in this classic report that Gottesman and his co-author first imported the term “endophenotype” from evolutionary biology to psychology and psychiatry. Irv used the term to signify characteristics, biological or psychological, that were more affected by genetic liabilities to schizophrenia than was the diagnosis (“exophenotype”) of schizophrenia itself. In his words, he and Shields were optimistic that someday the field “will discover an endophenotype . . . which will not only discriminate schizophrenics from other psychotics but will also be found in all identical co-twins of schizophrenia whether concordant or discordant” (Gottesman & Shields, 1972, p. 336). A recent review of this now vast literature on endophenotypes among relatives of schizophrenia patients (Gottesman & Gould, 2003) is among his most influential articles, being cited over 4,500 times (according to the *Google Scholar* database) as of this writing.

Following his fellowship in London, Irv returned to the United States, working at the University of North Carolina at Chapel Hill before returning in 1966 to the Department of Psychology at the University of Minnesota. At around this time, he and Shields published another groundbreaking work (Gottesman & Shields,

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1967), which used Falconer's quantitative genetic theory to show that the extant twin and family data on schizophrenia could be explained well by the cumulative effect of innumerable small genetic influences that produce the syndrome of schizophrenia when they exceed a given threshold (the multifactorial threshold model of schizophrenia). Published at a time when most genetic researchers believed in a single major locus model of schizophrenia, this polygenic model remained very much a minority view until relatively recently, when it has been resoundingly affirmed by large-scale genome-wide association studies that have revealed hundreds to thousands of common genetic variants, each providing only a very small increase in risk (Schizophrenia Working Group of the Psychiatric Genomics, 2014).

In 1980, Irv moved to the Department of Psychiatry at Washington University and then in 1985 to the Department of Psychology at the University of Virginia, where he remained until his "retirement" in 2001 (all of us who knew Irv knew that he never truly retired, as he was remarkably intellectually active until his death). As was his wont, he spent a very active retirement as Bernstein Professor of Psychiatry and Senior Fellow in Psychology at his doctoral alma mater, the University of Minnesota, from 2001 until his death in 2016. The second author (Lilienfeld) saw Irv at the University of Minnesota's clinical program Research Day just a few months before he passed away. Irv was as lively, engaged, and jovial as ever, and he was actively taking notes and interacting with colleagues and graduate students.

Irv's awards during his distinguished career were numerous, including the Stanley R. Dean Research Award, Dobzhansky Award from the Behavior Genetics Association, William James Book Award from the American Psychological Association (APA), Distinguished Scientific Contributions Award from APA, Lifetime Achievement Award from the International Society for Psychiatric Genetics, Zubin Award from the Society for Research in Psychopathology, Leiber Prize from the National Association for Research on Schizophrenia and Depression, and James McKeen Cattell Fellow Award from the Association for Psychological Science. In addition to his signature scientific accomplishments, Irv was also especially proud of his efforts in advocating for the ethical use of genetic

knowledge and the importance of human rights and equality before the law.

Let us conclude with a quotation of the last lines from Irv's published dissertation: "Granting that the difficulties in accurately assessing the contribution of heredity to variation in socially important behavior are great, such efforts will not have been in vain if they contribute to a greater understanding of the sources of individual differences. The provision of an optimum environment for the optimum development of the various aspects of human behavior should follow such increased understanding" (Gottesman, 1963, p. 20).

In an attempt to honor Irving Gottesman's extraordinary life and accomplishments with this Special Section of *Clinical Psychological Science*, we are fortunate to have obtained contributions from several prominent psychological scientists who have made significant contributions to clinical science. These include a few of Irv's former mentees, both formal and informal (David and Lisabeth DiLalla, Keith Neuchterlein, Carol Prescott, Irwin Waldman), and faculty colleagues (Thomas Bouchard, Peter McGuffin, Eric Turkheimer). We and the field will miss him dearly, but his enormous intellectual influence lives on.

#### Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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