Twin Studies in Behavior Genetics

TWIN STUDIES AND HUMAN BEHAVIOR

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Twin studies, when properly designed, constitute a powerful tool in partitioning genic from environmental influences upon behavior, and yet, they are rarely used by psychologists, psychiatrists, or other behavioral scientists examining normal or deviant behavior in *homo sapiens*. With the notable exceptions of schizophrenia and intelligence, human twin studies have barely been attempted. When it comes to mental changes with advancing age, for example, there are less than a handful in all the world, while we know of no efforts, other than our own, to utilize twins for the elucidation of psychobiological interactions responsible for the behavioral effects of drugs. The difficulties inherent in such studies are inadequate to explain their lack of popularity when compared to other investigative techniques, so that alternate causes must be sought. The conclusion can hardly be avoided that high among these causes rank a general unawareness of the information which can be gained from twin studies, an idea that environmental and genic factors are so intertwined as to be inseparable, a conviction that demonstrating genic influences upon any behavior render that behavior unalterable (i.e., impervious to nongenic influences) and a consequent reluctance of behavioral scientists, at least in the United States, to acknowledge the operation of genic factors among the determinants of human behavior, as distinguished from the behavior of all other animals.

The manifold uses of twin studies elaborated at this Congress make it abundantly clear that we can no longer afford to have affective rather than cognitive considerations decide the design of our research.

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1. *Cognitive Processes*

BIOLOGY OF HUMAN INTELLIGENCE

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Because intelligence has a different meaning to different people it is necessary to use an operational definition and it is referred to as a quantitated result of a specific test and expressed in IQ points.

Intelligence tests were devised to measure the normal variation in school children and to be used as a prognostic instrument. As such, they serve rather well, but it is still not known to what extent they measure genetically determined capabilities. However, as with any other phenotypical trait, it must be postulated that there are several causes of variation and one of them must ultimately depend on the individual genotype.

Intelligence distribution in the population is not normal, even though tests were designed to describe a normal distribution. It seems most reasonable to assume that intelligence is a multifactorial trait which means that polygenes, additive effects, epistasis, dominance, and a variety of environmental effects, have to be taken into consideration. When such causes of variation play upon a population of healthy individuals, one could expect a normal variation. It is, however, important to realize that this normal variation becomes disrupted by the occurrence

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