Pergamon

0021-9630(94)00170-7

J. Child Psychol. Psychiat. Vol. 36. No. 5, pp. 775–785, 1995
Elsevier Science Ltd

0021-9630/95 $9.50 + 0.00

A Twin Study of Competence and Problem Behavior in Childhood and Early Adolescence

Craig Edelbrock*, Richard Rende†, Robert Plomin‡ and Lee Anne Thompson§

Abstract—The Child Behavior Checklist (CBCL) was completed by parents of 181 pairs of same-sex twins ages 7–15 (mean age = 11.0 years). Correlations between scores on the CBCL scales for 99 pairs of monozygotic twins and 82 pairs of dizygotic twins indicated significant genetic influences that varied according to the specific area of competence and problem behavior. Model-fitting estimates derived from multiple regression analyses indicated significant genetic influence on competence in school and on all areas of problem behavior. In addition, significant shared environmental influence was detected for amount and quality of participation in activities, quality of social relationships, performance in school, anxiety/depression, and delinquent behaviour. Implications for future work on the mechanisms underlying these effects are discussed.

Keywords: Genetic effects, child psychopathology, problem behaviour, twin study

Introduction

Genetic studies have indicated substantial heritability for behavioral dimensions related to child psychopathology (see Rutter, Macdonald, Le Couteur, Harrington, Bolton & Bailey, 1990 for a recent review of empirical findings). Twin studies, for example, have detected genetic influence on broad-band internalizing and externalizing syndromes (Hewitt, Silberg & Erickson, 1990; Silberg *et al.*, 1994), as well as more circumscribed narrow-band syndromes such as attention problems/hyperactivity (see Plomin, 1991). This evidence was enhanced by Goodman and Stevenson's (1989a, b) recent twin study. Their analysis of parent

Accepted manuscript received 14 *November* 1994

*Penn State University.
†Rutgers University.
‡Institute of Psychiatry, London.
§Case Western Reserve University.

Requests for reprints to: Craig Edelbrock, 110 South Henderson, University Park, PA 16802 U.S.A.

and teacher questionnaire data on a general population sample of twins yielded a heritability estimate of 60% for the hyperactivity dimension. Seven family studies have also indicated familial resemblance for hyperactivity (reviewed by Deutsch & Kinsbourne, 1990). As Rutter *et al.* (1990) have pointed out, however, the high degree of overlap between attention problems/hyperactivity and oppositional and conduct disturbances, makes it unclear if the family loading is specific to attention problems/hyperactivity or is more general. Future research could determine if the genetic and environmental contributions to attention problems/hyperactivity are similar to or different from those for conduct disturbances.

Results of twin and adoption studies indicate strong genetic influence on *adult* criminality and antisocial behavior, but the picture is less clear for conduct disturbances in childhood and adolescence (Rutter *et al.*, 1990). Several studies have detected little or no genetic influence for juvenile antisocial behavior and delinquency (Cadoret, 1978; Bohman, 1971, 1972). Rowe (1983, 1986) has found that twins who commit delinquent acts often do so together. Since being "partners in crime" tends to occur among both identical and fraternal twins, genetic effects appear much smaller than the effects of shared environment. The importance of shared familial factors in self-reported delinquent behavior was recently confirmed by Rowe, using a sibling research design with a large, national probability sample of 15–22-year-olds (Rowe, Rodgers & Meseck-Bushey, 1992). Unfortunately, this design can not resolve the shared influences into genetic and environmental components.

Some evidence suggests that aggressive behavior is more heritable than "nonaggressive" (i.e. delinquent) conduct disturbances. Jary and Stewart (1985), for example, found that among 37 adoptees diagnosed for aggressive conduct disorder, 30% of the biological fathers and 59% of the biological mothers were diagnosed as antisocial, compared to none of the adoptive parents. Likewise, a twin study by Ghodsian-Carpey & Baker (1987) found a strong genetic effect for parents' ratings of aggressive behavior in young children. The picture is complicated, however, in that little genetic influence has been found when aggression is defined as a psychological trait or personality dimension as opposed to a more overt behavioral syndrome; or when it is measured using projective tests or personality inventories, rather than more reliable or direct methods (see Plomin, Nitz & Rowe, 1990). An important question to be addressed in future research is if genetic and environmental influences vary for aggressive versus nonaggressive conduct disturbances.

The goal of this study was to estimate the size of genetic and environmental influences on parent-reported competence and problem behavior in middle childhood and early adolescence. Many previous studies have focused solely on psychopathology and have ignored positive, adaptive aspects of children's functioning. Some studies have used unstandardized measures of unknown reliability and validity, have limited analyses to broad behavioral groupings (Silberg *et al.*, 1994; Hewitt *et al.*, 1992), or have been limited to one narrow syndrome or disorder. To overcome these limitations, we sought to (a) use a standardized measure of child functioning having well-established reliability and