Available online at www.sciencedirect.com
ScienceDirect
Journal of Adolescence 31 (2008) 355–370
Journal of Adolescence
www.elsevier.com/locate/jado

Continuity, comorbidity and longitudinal associations between depression and antisocial behaviour in middle adolescence: A 2-year prospective follow-up study

Minna Ritakallio[a,b,*], Anna-Maija Koivisto[a,c], Bettina von der Pahlen[d,e], Mirjami Pelkonen[a,e,f], Mauri Marttunen[e,f,g], Riittakerttu Kaltiala-Heino[a,h]

[a]*University of Tampere, Tampere School of Public Health, Tampere, Finland*
[b]*Tampere University Hospital, Adolescent ward, Tampere, Finland*
[c]*Tampere University Hospital, Research Unit, Tampere, Finland*
[d]*Department of Psychology, University of Åbo Akademi, Åbo, Finland*
[e]*National Public Health Institute, Department of Mental Health and Alcohol Research, Helsinki, Finland*
[f]*Department of Adolescent Psychiatry, Peijas Hospital, Helsinki University Hospital, Vantaa, Finland*
[g]*Department of Adolescent Psychiatry, University of Kuopio, and Kuopio University Hospital, Kuopio, Finland*
[h]*Department of Adolescent Psychiatry, Tampere University Hospital, Tampere, Finland*

Abstract

The study investigated continuity, comorbidity and longitudinal associations between depression Beck depression inventory (RBDI) and antisocial behaviour Youth self-report (YSR) in middle adolescence. Data were used from a community sample of 2070 adolescents who participated in a 2-year prospective follow-up study. The results indicate that both depression and antisocial behaviour had considerable continuity, and concurrent comorbidity between these disorders was strong. In contrast to several previous studies, antisocial behaviour did not predict subsequent depression, but conversely, depression predicted subsequent antisocial behaviour among girls. Among boys history of depression seemed to protect from subsequent antisocial behaviour. Gender differences in longitudinal associations are discussed.

*Corresponding author. University of Tampere, Tampere School of Public Health, Tampere, Finland.
E-mail address: minna.ritakallio@uta.fi (M. Ritakallio).

0140-1971/$30.00
doi:10.1016/j.adolescence.2007.06.006

Introduction

Previous studies have established that both depression and antisocial behaviour in adolescence have considerable continuity (Fergusson, Lynskey, & Hoorwood, 1996; Kim et al., 2003; Wiesner, 2003). In a longitudinal study by Beyers and Loeber (2003) 6–35% of the variance of current depression was explained by prior depression, the corresponding variance predicting current delinquency was 25–34%. Similarly, Costello, Mustillo, Erkanli, Keeler, and Angold (2003) found that adolescents with a history of depression were four times more likely than those with no previous depression to have depression in the future. The corresponding odds ratio (OR) for antisocial behaviour among those with a history of antisocial behaviour was about 10. Girls showed more continuity of depression than boys, but no gender differences were found in the continuity of antisocial behaviour. In contrast, Ferdinand, Verhulst, and Wiznitzer (1995) found that continuity of both depression and antisocial behaviour did not differ by sex. According to Angold et al. (1999) and Costello et al. (2003) the stability described above represents homotypic continuity in which manifestations of the disorder in question change relatively little over time so that diagnosis remains the same at different assessments.

High rates of concurrent comorbidity of adolescent depression and antisocial behaviour have been well established in both clinical (Biederman, Faraone, Mick, & Lelon, 1995; Goodyer, Herbert, Secher, & Pearson, 1997; Grilo et al., 1996) and population-based samples (Beyers & Loeber, 2003; Fergusson & Woodward, 2002; Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998; Ritakallio, Kaltiala-Heino, Kivivuori, & Rimpelä, 2005; Vermeiren, Deboutte, Ruchkin, & Schwab-Stone, 2002). In a meta-analysis of community studies Angold et al. (1999) found that after controlling for other comorbidities, conduct disorder was about seven times more common in depressed than in non-depressed adolescents. Previous research on gender differences in comorbidity, however, is inconsistent as some studies have found that depression is more prevalent among antisocial girls than boys (Costello et al., 2003; Flannery et al., 2001) while others have found the opposite (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004).

In studying developmental associations between depression and antisocial behaviour the concept of heterotypic continuity is pivotal. Heterotypic continuity refers to a continuous process in which one disorder generates manifestations of different forms over time or in which one disorder exposes adolescents to different disorders at different ages (Angold et al., 1999; Costello et al., 2003). There are at least three possible developmental models (acting out, failure and mutual influence model) to explain the heterotypic continuity between adolescent depression and antisocial behaviour. The models differ in whether they assume associations to be causal (one disorder creates an increased risk for the other) or non-causal (association based on non-specific risk factors) or disorders are reciprocally associated with each other (Caron & Rutter, 1991; Fergusson et al., 1996; Overbeek, Vollebergh, Meeus, Engels, & Luijpers, 2001; Wiesner, 2003).

The *acting out model* proposes that depressed adolescents act out internalising problems and depression is masked out by antisocial behaviour. This model assumes that depression precedes antisocial behaviour and the cross-lagged associations are unidirectional and causal (Capaldi, 1992; Overbeek et al., 2001). The *failure model* assumes that there is a causal, unidirectional association between antisocial behaviour and subsequent depression. Antisocial adolescents face many problems in social relations (e.g. rejection, lack of support, conflict with parents and