Psychopathology From Childhood Into Adulthood:

Follow-Up of An Epidemiological Sample

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Follow-Up of An Epidemiological Sample

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1 Introduction

Chapter 1
Introduction

Understanding the origins, nature, and course of psychopathology across the life span is of importance for mental health professionals working with children as well as for those working with adults. Mental health professionals who work with children are concerned about the long term consequences of disorders in children and adolescents, whereas mental health professionals working with adults are often concerned about childhood origins of adult psychopathology. From both child and adult perspectives it is hoped that the knowledge about the developmental processes underlying the course of psychopathology will give us clues with respect to the prevention and intervention of psychopathology. The individual and societal burdens that are inherent in the less favorable courses of many child and adolescent psychiatric disorders make it crucial to gain more empirical knowledge of the development of psychopathology from childhood, across adolescence, and into adulthood, and the processes influencing the development.

Continuities and Discontinuities of Psychopathology

Regarding the developmental processes, a central focus on the nature and extent of continuities and discontinuities is needed. Disordered development is characterized by both continuity and qualitative change over time. Whereas change in functioning remains possible at each transitional turning point in development, prior adaptation does place constraints on later adaptation. The longer an individual continues along a maladaptive pathway, the more difficult it is to reclaim a normal developmental trajectory (Sroufe, 1990).

Furthermore, one may wonder whether early problem behavior will lead to problem behavior later in life and, more specifically, whether later problem behavior resembles earlier behavior. Several questions are apparent when this issue is considered. For example, do anxious children develop into anxious adults? Or does anxiety predict a different outcome, such as aggression, in adulthood? In other words, is the continuity of psychopathology homotypical or heterotypical? When looking more closely at pathways from childhood, through adolescence, and into

adulthood, both heterotypic and homotypic continuities may occur, because behaviors may change in form whilst still reflecting the same basic process (Rutter, 1989). A range of outcomes in adulthood may be associated with a given pathway (multifinality), and particular pathways may uniquely be associated with a given outcome (equifinality). The principles of multifinality and equifinality have been shown to be relevant to developmental psychopathology (Cicchetti and Cohen, 1995), and a vast majority of longitudinal studies confirmed these two basic principles of the developmental psychopathology perspective (Egeland et al., 1996).

Basic to the developmental considerations of psychopathology in children and adolescents is the recognition that boys and girls tend to differ both in symptomatology and behavior patterns predictive of later disorders (Nottelmann and Jensen, 1995). It is also clear that rates of disorder change differentially in boys and girls (Angold and Costello, 1995). For instance, conduct disorder is more common in boys than in girls and becomes even more common in adolescence. Depression is twice as prevalent in females than in males (Weissman and Klerman, 1977), although this sex difference does not seem to appear until some time in adolescence. These findings also demonstrate that the rates of psychiatric disorders change with age. In addition, there is good evidence that symptom patterns also change with age, even within diagnostic categories such as conduct disorder, depression, and ADHD (Angold and Costello, 1995). This may be caused by the fact that age reflects the various different aspects of biological maturation, cognitive level, social status, the duration of experiences, and the type of experiences encountered (Rutter, 1988). Therefore, both sex and age must be taken into account in the assessment of the extent and nature of continuities of psychopathology between childhood and adult life.

Poor Outcome Events and Impaired Social Functioning

In addition to information about the continuity and discontinuity of psychopathology across a wide age range, it is also important to determine the broader consequences of child psychopathology for adult functioning, including referral to mental health services, arrest by the police, expulsion from school or job, alcohol abuse, and suicidal behavior, as well as impaired social functioning. These signs of maladjustment and social dysfunctioning are intrinsically important in evaluating

people's functioning in adulthood and are of importance for clinicians as well as nonclinicians.

It has been found, in adults, that social dysfunctioning tends to have a less favorable and more protracted course than psychopathology (Paykel and Weissman, 1973; Waryszak, 1982; De Jong et al., 1986). In addition, social dysfunctioning also seems to react to other types of interventions than those designed for the treatment of psychopathology (Bothwell and Weissman, 1977; Platt et al., 1981).

Because certain signs of poor outcome may be manifested by people with behavioral and emotional problems, whereas other signs may lack one-to-one associations with psychopathology, it is important to identify predictors of signs of maladjustment whether or not those who manifest them would also be considered deviant.

Methodological Issues

Despite the importance of studies on psychopathology from childhood into adulthood, knowledge in this area has been hampered by a number of methodological limitations, such as reliance on clinical samples, which limit the generalizability of findings as a result of referral bias (Caron and Rutter, 1991); the use of retrospective designs, resulting in possible distortions in reporting or recall (e.g., Verhulst, 1995); and the focus on a limited range of behaviors, without taking account of comorbidity (e.g., Caron and Rutter, 1991). These methodological problems can be avoided by (a) using a general population sample, because conclusions drawn from representative general population samples can be generalized; (b) using a prospective longitudinal design because this approach is superior for studying individual functioning over time, although it is liable to sample attrition and has the disadvantage that it takes a long time before results can be obtained (Verhulst and Koot, 1991); and (c) using assessment instruments that cover a broad range of behaviors and that provide continuity from childhood, through adolescence, and into adulthood, because when the assessment procedures are different across time, it will be unclear whether differences in the level and type of psychopathology reflect developmental processes or merely the differences between assessment procedures.

A general conclusion from the foregoing can be drawn: to fully elucidate developmental continuities and discontinuities of psychopathology, it is important to study psychopathology prospectively in a general population sample, taking account of sex and age, assessing a broad range of behavioral and emotional problems from childhood through adolescence and into adulthood, and using standardized assessment instruments that are comparable across time. To fully determine the broader later consequences of childhood psychopathology, information about poor outcome events and social impairment in adulthood must be obtained as well.

Psychopathology from Childhood into Adulthood

Since the late 1970s several child psychiatric community studies, using prospective designs have been conducted, including the Isle of Wight study (Graham and Rutter, 1973); the Dunedin study (Caspi et al., 1996); the Ontario Child Health Study (Offord et al., 1992); the Great Smoky Mountains Study (Costello et al., 1997); the New York State study (Pine et al., 1998); the National sample study, United States (Achenbach et al., 1995b); the Christchurch study (Fergusson et al., 1997); and the Zuid-Holland study, the Netherlands (Hofstra et al., 2000). Results generally indicate moderate stabilities of problem behavior within childhood and adolescence. Of these studies, only a few have reported on outcomes into adulthood (Achenbach et al., 1995b; Caspi et al., 1996; Fergusson et al., 1997; Hofstra et al., 2000; Pine et al., 1998). We examine these studies below (see also Table 1.1).

Prospective Studies: An Overview

United States National Sample Study

A national sample of 2,734 children, aged 4 through 16 years, was initially assessed in 1986 via home interviews with parents. The sample was selected to be representative of the 48 contiguous states with respect to ethnicity, socioeconomic status (SES), geographic region, and urbanity. This national sample has been reassessed in 1989 and in 1992. Subjects were 10 through 22 years old in 1992. High response rates were maintained through the years (Achenbach et al., 1995b).

At initial assessment parents completed the ACQ (Achenbach, Conners, Quay) Behavior Checklist (Achenbach et al., 1991). At follow-up, the ACQ was replaced by the Child Behavior Checklist (CBCL; Achenbach, 1991a) because it was found

Table 1.1

Prospective studies: an overview

Study	Initial sample size	Age(s) at each time of assessment	Sampling method	Follow-up intervals and response rate	Definition of psycho-pathology	Measures of psycho-pathology	Research questions	Results
United States (Achenbach, 1995; Achenbach *et al.*, 1998)	2,734	(1) 4-16; (2) 7-19; (3) 10-22	Sample representative of US population	3 yr (90%); 6 yr (96%)	Statistical; ACQ; empirical syndromes	CBCL/4-18; YABCL; TRF; YSR; YASR;	Stability; prediction of deviance; identifying predictors and risk factors	Several young adult syndromes were strongly predicted by their adolescent counterparts (across a 6-yr follow-up); Delinquent behavior scale predicted the most poor outcomes, from adolescence into adulthood
Dunedin Study (Silva, 1990; McGee *et al.*, 1992 Feehan *et al.*, 1993; Caspi *et al.*, 1996)	1,037	(0) birth; (1) 3; (2) - (10) every 2 yr	Year cohort born at the Dunedin obstetric hospital	2-3 yr (> 90%)	Statistical; clinical; DSM criteria	BP; Rutter scale A & B; DISC-C; DIS	Prevalence, change, persistence, and risk factors of problem behavior	Specific behavior styles at age 3 were connected to specific psychiatric problems in adulthood; the percentage of cases with psychiatric disorder increased steadily from ages 11 to 21

Table 1.1 continues

Table 1.1 (continued)

Study	Initial sample size	Age(s) at each time of assessment	Sampling method	Follow-up intervals and response rate	Definition of psycho-pathology	Measures of psycho-pathology	Research questions	Results
New York State (Cohen *et al.*, 1993a; Pine *et al.*, 1998)	975	(1) 1-10; (2) 9-18; (3) 11-20; (4) 18-27	Random selection in two upstate New York counties	8 yr (84%); 2.5 yr; 7 yr	Problem scale scores; DSM criteria	a priori item pool; DISC-C; DISC-P; DIS	Persistence of disorder; identification of risk factors for persistence	Anxiety and depressive disorder during adolescence causes a strong risk for recurrent anxiety or depressive disorders during adulthood
Christchurch Study (Fergusson *et al.*, 1989; Fergusson *et al.*, 1996; Fergusson *et al.*, 1997)	1,265	(1) birth; (2) 4 months; (3) 1 yr; annual up to age 16, age 18	Birth cohort of children born in the Christchurch urban region during mid 1977	4 months; annual up to age 16; again at age 18 (80-90%)	DSM criteria	combined Rutter & Conners rating scale; RBCP; SRED; DISC-C;	Stability; identification of factors associated with persistence	Peer factors played an influential role in behavioral change in adolescence; attentional difficulties at the age of 8 years were related to academic success in young adulthood (subjects were aged 18 years)

Table 1.1 continues

Table 1.1 (continued)

Study	Initial sample size	Age(s) at each time of assessment	Sampling method	Follow-up intervals and response rate	Definition of psycho-pathology	Measures of psycho-pathology	Research questions	Results
Zuid-Holland study (Verhulst *et al.*, 1985a; 1985b; Verhulst and Van der Ende, 1992a; 1992b; Ferdinand and Verhulst, 1995a; 1995b; Hofstra *et al.*, 2000)	2,076	(1) 4-16; (2) 6-18; (3) 8-20; (4) 10-22; (5) 12-24; (6) 18-30	Random sample from municipal birth registers	2 yr intervals (80%; 82%; 71%; 77%) 6 yr (81%)	Problem scale scores; DSM criteria	CBCL/4-18; TRF; YSR; YASR; YABCL; CIDI-DIS	Stability, persistence, and change; prediction of disturbance	(up to time 5): Children (aged 4-16) who were scored in the deviant range of the Total Problem score at time 1, were nine times more likely to be scored deviant 6 years later, than were children who were not deviant at initial assessment. Of the individuals (aged 13-16) with deviant CBCL Total Problem scores, 27.3% had deviant YASR Total Problem scores at 8-year follow-up

Note. Instruments with abbreviations in the table: ACQ, ACQ Behavior Checklist (Achenbach, 1991a); BP, Behavior Profile (Caspi *et al.*, 1996); CBCL/4-18, Child Behavior Checklist for ages 4-18 (Achenbach, 1991a); CIDI, Composite International Diagnostic Interview (World Health Organization, 1992); Conners rating scale (Conners, 1970); DIS, Diagnostic Interview Schedule (Robins *et al.*, 1981); DISC, Diagnostic Interview Schedule for Children (Costello *et al.*, 1982); -C = Child version; -P = Parent version); RBPC, Revised Behavior Problem Checklist (Quay and Peterson, 1987); Rutter scale (Rutter and Tizard, 1970); SRED, Self-Report Early Delinquency scale (Moffitt and Silva, 1988); TRF, Teacher's Report Form (Achenbach, 1991b); YABCL, Young Adult Behavior Checklist (Achenbach, 1997); YASR, Young Adult Self-Report (Achenbach, 1997); YSR, Youth Self-Report (Achenbach, 1991c).

to discriminate better between referred and nonreferred samples and it has parallel teacher and self-report forms. When subjects were 19 years or older, parents completed the Young Adult Behavior Checklist (YABCL; Achenbach, 1997). In 1989 and 1992, subjects aged 11 to 18 completed the Youth Self-Report (YSR; Achenbach, 1991c), and subjects aged 19 years or older completed the Young Adult Self-Report (YASR; Achenbach, 1997). For subjects attending school, teachers completed the Teacher's Report Form (TRF; Achenbach, 1991b). For further details see Achenbach et al. (1995b).

When looking at the 6-year continuities and predictive paths from child/adolescent syndromes (subjects aged 13-16 years) to adult syndromes (subjects aged 19-22 years) it was found that several young adult syndromes were strongly predicted by their adolescent counterparts. Furthermore, when trying to identify adolescent predictors of young adult signs of maladjustment, Achenbach et al. (1998) tested predictors of school drop-out, unwed pregnancy, substance use, mental health services, suicidal behavior, police contacts, and being fired from jobs in young adulthood across informants (parents and adolescents themselves). Subjects (n = 743) were 13 through 16 years old at initial assessment, and 19 through 22 years at 6-year follow-up. Using case-control analyses it was found that the Delinquent Behavior syndrome predicted the most poor outcomes.

The Dunedin Study

The Dunedin Multidisciplinary Health and Development Study is a longitudinal study of a complete cohort born within a 1 year interval (1972-1973), in the only obstetric hospital in Dunedin, New Zealand. When the children were traced for follow-up at age 3 years, 91% of the eligible births participated in the assessment, providing a base sample of 1,037 (52% male and 48% female) for longitudinal study. The Dunedin cohort has been reassessed with a battery of psychological, medical, and sociological measures at ages 3 (n = 1,037), 5 (n = 991), 7 (n = 954), 9 (n = 955), 11 (n = 925), 13 (n = 850), 15 (n = 976), 18 (n = 1,008), and, most recently, 21 years (n = 992). The follow-up of subjects has been very thorough, even subjects who had immigrated were traced, resulting in remarkably high response rates. For details see Silva (1990).

At age 3 years, children participated in a 90-minute testing session involving cognitive and motor tasks. Subjects were classified on the basis of these behavioral observations into 1 of 5 groups (undercontrolled, inhibited, well-adjusted, confident, and reserved. At ages 11, 13, and 15, the Dunedin study used a modified version of the Diagnostic Interview Schedule for Children – Child Version (DISC-C; Costello et al., 1982) to identify symptomatology for 12 different DSM-III childhood disorders. At ages 18 and 21, DSM-III-R diagnoses were determined using a modified version of the Diagnostic Interview Schedule (DIS; Robins et al., 1981) The modifications to the DISC-C and DIS for the Dunedin study have been reported by Anderson et al. (1987) for the sample at age 11, by McGee et al., (1990) for age 15, and by Feehan et al. (1994) for age 18.

Caspi et al. (1996) tested whether behavioral observations at age 3 were predictive of psychiatric disorders at age 21. Undercontrolled and inhibited children were at risk of later psychiatric problems. Furthermore, specific behavior styles in early childhood were connected to specific psychiatric problems in adulthood. When looking at the continuities and discontinuities of psychiatric disorders it was found that, from ages 11 to 15 years, of those with disorder at age 11, 40% were also identified at age 15. Externalizing disorders showed more continuities for boys, and internalizing problems for girls (McGee et al., 1992). From ages 15 to 18 years, two third of those with disorder at age 15 had disorder at age 18 (Feehan et al., 1993). When looking (longitudinally) at prevalences of psychiatric disorder from ages 11 to 21, it was found that the percentage of cases with psychiatric disorder increased steadily with age of the sample. Significant increases in the rates of psychiatric disorder occurred between the ages of 13 and 15, and again between the ages of 15 and 18 years (Newman et al., 1996).

The New York State Study

Children in the 1- to 10-year age range from 975 families were originally sampled in 1975 when they were living in two upstate New York counties. Eight years later (1983), 84% of the original sample were located for follow-up interviews of children, who were then aged 9 to 18, and their mothers. The sample was supplemented with 54 families to replace losses from low-income strata between

1975 and 1983 (Cohen et al., 1993b). Subjects were reassessed in 1985 and in 1992. Subjects were 18 through 27 years old at the latest assessment (Pine et al., 1998).

In 1983 and 1985, parent and child interviews assessed symptoms from DSM-III (1983) and DSM-III-R (1985) using modifications of the Diagnostic Interview Schedule for Children (DISC; Costello et al., 1985) At the latest assessment, in 1992, only young adults, but not their parents, provided diagnostic information (Pine et al., 1998).

When looking at the persistence of disorders of children aged 9- to 18-years, it was found that there was a substantial level of diagnostic persistence over a 2 ½ year follow-up for all diagnoses except major depression (Cohen et al., 1993a). Furthermore, when looking at the magnitude of longitudinal associations between adolescent (ages 9 through 18) and adult (ages 18 through 27) anxiety or depressive disorders, it was found that an anxiety or depressive disorder during adolescence causes a strong risk for recurrent anxiety or depressive disorders during early adulthood (Pine et al., 1998).

The Christchurch Study

The Christchurch Health and Development Study is a longitudinal study of a birth cohort of 1,265 New Zealand children born in the Christchurch urban region during mid 1977. These children have been studied at birth, 4 months, at annual intervals to the age of 16 years, and again at age 18 years, using data gathered from a combination of sources including maternal interview, child interview, teacher questionnaire, and other sources of information. For an overview of the study design see Fergusson et al. (1989).

As part of the data collection process, data were gathered on child behaviors using multiple reports from the age of 6 years onward. These assessments included the following: when children were aged 7 to 15 years maternal reports of childhood behaviors were gathered. From ages 7 to 14 years behavior was measured using an instrument which combined the Rutter (Rutter et al., 1970) and Conners (1970) behavior rating scales and at age 15 and 16 years behavior was measured using the Revised Behavior Problem Checklist (RBPC; Quay and Peterson, 1987). When children were aged 7 to 13 years, teacher reports of childhood behaviors were

obtained using an instrument which combined the Conners (1969) and Rutter (Rutter et al., 1970) teacher rating scales.

At age 14, 15, and 16 years self-reports were obtained from responses to the Self-Report Early Delinquency scale (Moffitt and Silva, 1988), and children were asked a series of questions relating to conduct/oppositional defiant behaviors derived from the Diagnostic Interview Schedule for Children (DISC; Costello et al., 1982). At age 18 subjects were interviewed using a questionnaire that combined a number of standardized questionnaires and covered a comprehensive range of outcomes such as educational outcomes, juvenile offending, and substance use (Fergusson et al., 1997).

When looking at the stability of conduct and oppositional defiant behaviors during the period from 7 to 15 years, strong continuities of behavioral problems were found (Fergusson et al., 1995). Furthermore, when looking at factors associated with continuity and changes in disruptive behavior patterns between childhood (7 to 9 years) and adolescence (14 to 16 years), it was found that peer factors played an influential role in behavioral change in adolescence, with individuals showing late onset of conduct problems having high rates of affiliation with delinquent peers but those showing remission of problem behaviors in adolescence having relatively low rates of such affiliations (Fergusson et al., 1996).

In addition, it was found that attentional difficulties during middle childhood (subjects aged 8 years) were related to academic success in young adulthood (subjects aged 18 years) even when due allowance was made for potentially confounding factors, and that attentional difficulties were unrelated to later juvenile offending or substance use behaviors in young adulthood after adjusting for confounding factors (Fergusson et al., 1997).

The Zuid-Holland Study

A sample of 2,067 children, aged 4 through 16 years, was initially assessed in 1983 via home interviews with parents. The sample was selected from the Dutch province of Zuid-Holland, a province with both highly urbanized and rural areas, using municipal registers that list all residents in the province The original sample has been reassessed in 1985 (time 2), 1987 (time 3), 1989 (time 4), 1991 (time 5),

and most recently 1997 (time 6). Subjects were 18 through 30 years old in 1997. High response rates were maintained through the years.

Parents completed the Child Behavior Checklist (CBCL; Achenbach, 1991a; Verhulst et al., 1996) at time 1 through time 5. At time 6 (1997) parents completed the Young Adult Behavior Checklist (YABCL; Achenbach, 1997). At time 3, time 4, and time 5 subjects aged 11 to 18 completed the Youth Self-Report (YSR; Achenbach, 1991c; Verhulst et al., 1997b), and subjects aged 19 years or older completed the Young Adult Self-Report (YASR; Achenbach, 1997) at time 5 and time 6. For subjects attending school, teachers completed the Teacher's Report Form (TRF; Achenbach, 1991b). At time 2 (1987), owing to financial constraints, a different procedure than at the other assessment points was followed: parental information was obtained by mail, and no information from teachers was obtained. For further details on data collection and response rates see Verhulst et al. (1990); Verhulst and Van der Ende (1992c); Ferdinand et al. (1995); and Hofstra et al. (2000).

Verhulst and Van der Ende (1992b) found, in a 6-year follow-up of subjects aged 4-16 at initial assessment, that children who were scored in the deviant range of the Total Problem score at time 1, were nine times more likely to be scored deviant 6 years later than were children who were not deviant at initial assessment. Ferdinand and Verhulst (1995a) examined the 8-year stability of behavioral and emotional problems from adolescence into young adulthood. They found that of the individuals aged 13 through 16 years with deviant CBCL Total Problem scores, 27.3% had deviant YASR Total Problem scores at 8-year follow-up. When parents' Child Behavior Checklist (CBCL; Achenbach, 1991a; Verhulst et al., 1996) ratings and demographic variables in adolescence (ages 13 through 16 years) were tested as candidate predictors of signs of maladjustment such as receiving mental health services, trouble with the police, suicide attempts, and alcohol abuse in young adulthood (ages 21 through 24 years) (n = 459) across an 8-year time span (Ferdinand and Verhulst, 1995a), it was found that referral to mental health services was predicted by deviant scores on the Anxious/Depressed scale, while suicide attempts were predicted by deviance on the Withdrawn scale.

Conclusion

The fact that different assessment procedures (even across assessment points in a few studies) were used and that studies pertained to different follow-up periods, hampered the comparability of the prospective studies examined above. In general, it was found that the stability of psychopathology, from childhood or adolescence into (young) adulthood was substantial (Achenbach et al., 1995b; Feehan et al., 1993; Ferdinand and Verhulst, 1995a).

Internalizing and Externalizing Problems. When looking at externalizing and internalizing problems, strong homotypical prediction was found. For instance, undercontrolled behavior in early childhood predicted antisocial personality disorder and involvement in crime in adulthood (Caspi et al., 1996), and adult problems were predicted by their adolescent counterparts (Achenbach et al., 1995b). Heterotypical prediction was found as well, for instance externalizing disorders (conduct disorder, oppositional, attention deficit disorder, and multiple disorders) at age 15 were associated with both internalizing disorders (depressive and anxiety disorders) and externalizing disorder types (conduct disorder and substance abuse) at age 18 (Feehan et al., 1993). In addition, externalizing problems and internalizing problems from adolescence into young adulthood were found to be equally stable (Ferdinand and Verhulst, 1995b). In contrast, when looking at the continuity from childhood into adolescence, it was found that externalizing disorders showed more continuity for boys, and internalizing disorders showed more continuity for girls (McGee et al., 1992).

Poor Outcome. When poor outcome was the focus at follow-up, delinquent behavior in adolescence predicted most poor outcomes in adulthood (Achenbach et al., 1998), and attentional problems were found to be associated with poor academic success in young adulthood (Fergusson et al., 1997). Furthermore, referral to mental health services and suicide attempts in young adulthood were predicted by internalizing problems in adolescence (Ferdinand and Verhulst, 1995a).

Males versus Females. Several findings from the longitudinal studies differed for males versus females. For instance, different pathways of psychopathology from adolescence into young adulthood were found for males versus females (Achenbach et al., 1995b). Both undercontrolled and inhibited boys were more likely than girls to report alcohol-related problems at age 21 (Caspi et al., 1996), but adolescent alcohol

abuse in girls seemed to have a more persistent course than in boys (across a 2 ½ year follow-up; Cohen et al., 1993a).

From this overview it can be concluded that a variety of pathways of psychopathology, from childhood and adolescence into (young) adulthood are found, when psychopathology is assessed in general population samples, with high response rates across assessment points, using standardized instruments examining a broad range of behaviors.

A number of issues concerning the continuity and change of psychopathology from childhood into adulthood need further elucidation:

1. because follow-up intervals differed, and information from childhood into adulthood was obtained with different instruments, the continuity from a young age into adulthood as assessed with comparable instruments has still to be determined. The follow-up periods that have been reported, when looking at psychopathology across the years, did not capture the transition from childhood, through adolescence and young adulthood, into adulthood;
2. when looking at the course of psychopathology, the individual variations in longitudinal pathways of psychopathology from childhood into adulthood has not been taken into account so far, and one may wonder what for instance the impact is of a chronic pathway of behavioral and emotional problems from adolescence into adulthood on outcome in adulthood, compared to the situation that problems emerge de novo in adulthood;
3. not only is the continuity and change of psychopathology as such of importance; the broader consequences of childhood problems in adulthood are very significant as well. The consequences of psychopathology in childhood and adolescence for social functioning and outcome variables, such as obtaining no formal education beyond elementary school, referral to mental health services, and suicide attempts or other self harm, in adulthood need further investigation.

The Present Study: Aims and Methods

The present study concerns the most recent follow-up of the Zuid-Holland prospective longitudinal study of the course of behavioral and emotional problems, which started in 1983. After the initial assessment (time 1, 1983), the population sample has been approached with time intervals of two years, until measurement 5

(1991), when subjects were aged 12 to 24 years. In 1997, after an interval of 6 years, all subjects had become adults (ages 18 to 30 years) and were approached for the sixth time (time 6).

Aims

With the present study we aimed to extend the existing knowledge on the continuity and change of psychopathology from childhood into adulthood, applying comparable assessment procedures that cover a broad range of problems across time. Furthermore, by adding a diagnostic interview at time 6, psychopathology was assessed using different diagnostic paradigms (empirically derived scales versus DSM-IV diagnostic categories).

The main aims of the present study were:

1. to determine the continuity and change of psychopathology from childhood into adulthood taking sex and age into account, and to investigate the predictive value of psychopathology in childhood and adolescence for later psychopathology, as assessed with a parent rating scale, a self-report rating scale, and a diagnostic interview;
2. to determine the effects of various longitudinal pathways of psychopathology on adult functioning;
3. to determine the predictive value of psychopathology in childhood and adolescence for poor outcome events and signs of impaired social functioning in adulthood.

Methods

Sample

The original sample of children consisted of 2,600 children aged 4 to 16, and was drawn from the Dutch province of Zuid-Holland, a province with both highly urbanized and rural areas. A random sample of 2,600 children and adolescents aged 4 to 16 years (100 children of each sex and each year cohort) was drawn from municipal registers that list all residents in the province. Two small municipalities out of a total of 86 declined to participate. Of the 2,447 parents who were reached, 2,076 (84.8%) cooperated by completing a Child Behavior Checklist (CBCL; Achenbach, 1991a; Verhulst et al., 1996) on their child (Verhulst et al. 1985a;

1985b). After the first time of measurement (1983, time 1), the sample was approached again in 1985 (time 2), 1987 (time 3), 1989 (time 4), 1991 (time 5), and, most recently in 1997 (time 6). To keep comparability with earlier publications based on this ongoing longitudinal study we retained the original indications of times of assessment.

Instruments

Across the assessments a number of comparable standardized instruments have been used, as can be seen in Table 1.2. At the most recent assessment (time 6), a diagnostic interview for obtaining DSM-IV diagnoses was added. Information concerning outcome in adulthood was obtained at final assessment as well.

The Child Behavior Checklist. The Child Behavior Checklist (CBCL; Achenbach, 1991a; Verhulst et al., 1996) is a questionnaire consisting of 120 items on behavioral and emotional problems during the past 6 months. The response format is 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true. The CBCL can be completed by parents of 4- to 18-year-olds and can be scored on 8 syndrome scales: Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior, and two broad-band groupings of syndromes: Internalizing (consisting of the Withdrawn, Somatic Complaints, and Anxious/Depressed scales), and Externalizing (consisting of the Delinquent and Aggressive Behavior scales). A Total Problem score is derived by summing the individual item scores. Good reliability and validity of the CBCL have been replicated for the Dutch translation (Verhulst et al., 1996).

The Young Adult Behavior Checklist. The Young Adult Behavior Checklist (YABCL; Achenbach, 1997) is an upward extension of the CBCL and has the same response format. The YABCL is designed to evaluate emotional and behavioral problems for ages 18 years and older. The YABCL can be completed by parents, parent surrogates, and others who know the subject well (e.g., spouses, partners, or friends), and can be scored on 8 syndrome scales: Anxious/Depressed, Withdrawn, Somatic Complaints, Thought Problems, Attention Problems, Intrusive Behavior,

Table 1.2

Zuid-Holland longitudinal study of child/adolescent psychopathology into adulthood

	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6
Year	1983	1985	1987	1989	1991	1997
Age	4-16	6-18	8-20	10-22	12-24	18-30
Instruments	CBCL	CBCL	CBCL	CBCL	CBCL	
						YABCL
	TRF		TRF	TRF	TRF	
			YSR	YSR	YSR	
				YASR	YASR	YASR
						CIDI-DIS
			Outcome	Outcome	Outcome	Outcome
			measures	measures	measures	measures

Note. Instruments with abbreviations in the table: Child Behavior Checklist (Achenbach, 1991a; Verhulst *et al*, 1996); Composite International Diagnostic Interview (World Health Organization, 1992), and three sections of the Diagnostic Interview Schedule (Robins, 1997); Teacher Report Form (Achenbach, 1991b; Verhulst *et al.*, 1997c); Young Adult Behavior Checklist (Achenbach, 1997); Young Adult Self-Report (Achenbach, 1997); Youth Self Report (Achenbach, 1991c; Verhulst *et al.*, 1997b).

Delinquent Behavior, and Aggressive Behavior, and two broad-band groupings of syndromes: Internalizing (consisting of the Anxious/Depressed and Withdrawn scales) and Externalizing (consisting of the Intrusive Behavior, Delinquent Behavior, and Aggressive Behavior scales). A Total Problem score is computed by summing the individual item scores. Good reliability and validity for the American YABCL have been reported by Achenbach (1997). For the Dutch YABCL, Heijmens Visser et al. (2000) found an average Cronbach's alpha across syndromes of .81 in a referred sample.

The Youth Self-Report. The Youth Self-Report (YSR; Achenbach, 1991c; Verhulst et al., 1997b) is a self-report questionnaire for ages 11- to 18- year-olds, and was modeled on the CBCL. The YSR has the same format as the CBCL, except that YSR items are worded in the first person. It contains 103 items covering emotional and behavioral problems during the previous six months, and 16 socially desirable items. The response format for the problem items is similar to the response

format of the CBCL. A Total Problem score is derived by summing the scores for each problem item. Two broad-band groups of syndromes are constructed, designated as Externalizing (consisting of the Delinquent Behavior and Aggressive Behavior scales), and Internalizing (consisting of the Withdrawn, Somatic Complaints, and Anxious/Depressed scales). Externalizing problems reflect conflicts with other people, whereas internalizing problems reflect internal distress. The good reliability and validity of the YSR (Achenbach, 1991c) were supported for the Dutch version (De Groot et al., 1996; Verhulst et al., 1997b).

The Young Adult Self-Report. The Young Adult Self-Report (YASR; Achenbach, 1997) is a questionnaire for 18- to 30-year-olds, and is an upward extension of the YSR. The YASR is designed to evaluate emotional and behavioral problems (plus adaptive functioning and substance abuse) for ages 18 years and older. The YASR is filled out by young adults to describe themselves. It contains 110 problem items. Nine YSR problem items that are specific for younger subjects were replaced by problems pertaining to adults, and seven items were added to the original YSR. Similar to the YSR, the problem items can be scored "0", "1", and "2". The YASR can be scored on 8 syndrome scales: Anxious/Depressed, Withdrawn, Somatic Complaints, Thought Problems, Attention Problems, Intrusive Behavior, Delinquent Behavior, and Aggressive Behavior, and two broad-band groupings of syndromes: Internalizing (consisting of the Anxious/Depressed and Withdrawn scales) and Externalizing (consisting of the Intrusive Behavior, Delinquent Behavior, and Aggressive Behavior scales). A Total Problem score is computed by summing the individual item scores. Good reliability and validity for the American YASR have been reported by Achenbach (1997). For an earlier and nearly identical version of the Dutch YASR, (Ferdinand et al., 1995) reported an 18-day test-retest reliability of r = .89 for the Total Problem score, and an average Cronbach's alpha across syndromes of .84. Validity of the Dutch YASR is supported by findings that problem scales showed significant differences between referred and nonreferred young adults (Wiznitzer et al., 1992).

The Composite Diagnostic Interview Schedule and the Diagnostic Interview Schedule. The computerized version of the Composite International Diagnostic Interview (CIDI; World Health Organization, 1992) and three sections of the Diagnostic Interview Schedule (DIS; Robins et al., 1997) were used to obtain

diagnoses of mental disorder in the 12 months prior to the interview. The CIDI and DIS are fully structured interviews to allow administration by lay interviewers and scoring of diagnoses by computer. The CIDI has some 300 questions chosen to cover the criteria for DSM-IV (American Psychiatric Association, 1994) diagnoses. Good reliability and validity have been reported for the CIDI (Andrews and Peters, 1998). Because information concerning disruptive disorders in adulthood (oppositional defiant, antisocial personality disorder, and attention deficit hyperactivity disorder) is lacking in the CIDI, sections of the DIS covering these disorders were translated into Dutch and administered.

Overall Functioning. The Global Assessment Scale (GAS; Endicott et al., 1976) was used to evaluate the overall functioning of a subject during the 6 months preceding the interview. The Global Assessment Scale was scored by the interviewer after completion of the interview. The scale value ranges from 1 to 100, and is divided into ten equal intervals: 1 to 10, 11 to 20, and so on to 81 to 90 and 91 to 100. The highest interval (91-100) indicates good functioning, while lower scores indicate problems in functioning.

Poor Outcome Events. Time 6 assessments included the following poor outcome events, indicating whether the subject (a) had been referred to mental health services; (b) had physically harmed him or herself or had attempted suicide; (c) had been arrested by the police; (d) had been expelled from school or job, all in the 12 months prior to the interview, and (e) had been more often drunk than others in the 6 months prior to the interview (i.e., alcohol abuse); or (f) did not obtain formal education beyond elementary school. To assess alcohol abuse, the number of times subjects had been drunk in the preceding 6 months was determined using the YASR (Achenbach, 1997) (item number 118). We computed cumulative frequency distributions for the frequency of being drunk, separately for males and females. A subject was judged as being more often drunk than others if he or she scored above the 90th percentile for the frequency of being drunk. General poor outcome was defined as the presence of at least one poor outcome event.

Impaired Social Functioning. Social functioning was assessed using the Groningen Questionnaire about Social Behavior (GQSB; De Jong and Van der Lubbe, 1994; Van der Lubbe, 1995). The GQSB contains 11 subscales covering different areas of functioning: spare time activities; self-care (i.e., bodily care and

hygiene, management of personal possessions, including direct living surroundings); civic sense (i.e., role as citizen, interest in and participation in society); daily activities (i.e., educational activities, employment, and housekeeping); parental functioning; family functioning (for subjects who do not live alone); family functioning, living alone (for subjects who live alone); intimate relationship with parents; intimate relationship with siblings; intimate relationship with partner; and social activities (limited to activities with friends). When filling out the questionnaire, subjects were asked to indicate whether items were applicable to their situation in the past four weeks. Each item has four response options, ranging from never to always. By summing the scores, a total score for each subscale is derived. Not all scales apply to all subjects; for instance the parental functioning does not apply to subjects who do not have children. Good reliability and validity of the GQSB have been found when examined in a Dutch general population sample (n = 672, ages 18 through 65 years, 57% female) (Van der Lubbe, 1995).

Twenty-six subjects could not answer questions regarding social activities (limited to activities with friends) because they indicated not to have any close friends. Having no close friends was added as a separate sign of impaired social functioning.

Structure of This Thesis

In **chapter 2**, information is provided on the continuity and change of psychopathology from childhood into adulthood. Subjects initially aged 4- to 16-years were assessed with the CBCL at time 1, and were reassessed 14 years later, at time 6, with the YABCL and the YASR, at ages 18 to 30. In **chapter 3**, we investigated the predictive value of psychopathology in childhood and adolescence as assessed with the CBCL at time 1, for DSM-IV disorders, as assessed with the Composite International Diagnostic Interview and three sections of the Diagnostic Interview Schedule at follow-up (1997, time 6). **Chapter 4** provides information on the prediction of signs of maladjustment in adulthood, such as poor outcome events (i.e., referral to mental health services, being arrested, being expelled from school or job, and alcohol abuse), and signs of impaired social functioning by behavior and emotional problems in childhood and adolescence 14 years earlier. In **chapter 5**, adolescents' self-reported problems as predictors of psychopathology in adulthood

were examined. At time 3, when subjects were aged 11 to 19, the YSR was filled out by subjects themselves. At 10-year follow-up, when subjects were aged 21-29 years, psychopathology was assessed using the YASR and the CIDI-DIS, for obtaining DSM-IV diagnoses. **Chapter 6** provides different pathways of self-reported problems from adolescence into adulthood, across a 10-year period. By constructing four contrasting subsamples the effect of differences in course of psychopathology on outcome in adulthood could be investigated. Finally, in **chapter 7** the main findings and conclusions of the foregoing chapters are presented and discussed. Moreover, research and clinical implications, and recommendations for future research are given.

2 Continuity and Change of Psychopathology From Childhood into Adulthood: A 14-Year Follow-Up Study

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Chapter 2

Continuity and Change of Psychopathology From Childhood Into Adulthood: A 14-Year Follow-Up Study

Abstract

Objective: *To test the 14-year continuity and change of behavioral and emotional problems from childhood into adulthood.* ***Method:*** *For 1,615 children and adolescents aged 4 to 16 years from the general population, parents completed the Child Behavior Checklist (CBCL) at initial assessment. At follow-up 14 years later, subjects completed the Young Adult Self-Report (YASR), and their parents completed the Young Adult Behavior Checklist (YABCL).* ***Results:*** *Of the subjects who were initially classified as deviant, 14 years later 41% were classified as deviant according to their YABCL Total Problem score, and 29% according to their YASR Total Problem score. Intrainformant (CBCL/YABCL) Withdrawn, Social Problems, Delinquent Behavior, and Aggressive Behavior scores, and cross-informant (CBCL/YASR) Anxious/Depressed, Thought Problems, and Delinquent Behavior scores were independent predictors of general levels of problem behavior.* ***Conclusion:*** *Childhood and adolescent problems persisted to a considerable degree into adulthood, although the majority of children who were deviant at initial assessment could not be regarded as deviant 14 years later. Children who were adolescents at initial assessment (12-16 years) showed higher stability of problem behaviors than subjects who were children at initial assessment (4-11 years).*

Introduction

Knowledge about the continuity and discontinuity of psychopathology across a wide age range is indispensable for answering questions concerning the development of psychopathology from childhood to adulthood, as well as questions concerning the childhood or adolescent origins of adult psychopathology. The main questions arising from a developmental perspective center on what happens to individuals with and without disorder over time, identifying individuals with significant disorders, and the pathways from initial problems to later outcome (Cicchetti, 1990). Despite its importance, knowledge in this area is hampered by a

number of methodological limitations, such as reliance on clinical samples, which limit the generalizability of findings as a result of referral bias (Caron and Rutter, 1991); the use of retrospective designs, resulting in possible distortions in reporting or recall (e.g., Verhulst, 1995); and the focus on a limited range of behaviors, without taking account of comorbidity (e.g., Caron and Rutter, 1991).

Since the late 1970s, several child psychiatric community studies using prospective designs have been conducted, including the Isle of Wight study (Graham and Rutter, 1973); the Dunedin study (Caspi et al., 1996); the Ontario Child Health Study (Offord et al., 1992); the Great Smoky Mountains Study (Costello et al., 1997); the New York State study (Pine et al., 1998); the National sample study, United States (Achenbach et al., 1995b); the Christchurch study (Fergusson et al., 1994); and the Zuid-Holland study, the Netherlands (Ferdinand et al., 1995). Results generally indicate moderate stabilities of problem behavior within childhood and adolescence, with externalizing behaviors showing somewhat higher stability than internalizing behaviors. Of these studies, only a few have reported on outcomes into adulthood (Achenbach et al., 1995b; Caspi et al., 1996; Ferdinand et al., 1995; Pine et al., 1998). Caspi et al. (1996) tested whether behavioral observations at age 3 were predictive of psychiatric disorders at age 21. At age 3, subjects were classified on the basis of behavioral observations, into 1 of 5 groups (undercontrolled, inhibited, well-adjusted, confident, and reserved). Undercontrolled and inhibited children were at risk of later psychiatric problems. Furthermore, specific behavior styles in early childhood were connected to specific psychiatric problems in adulthood.

Achenbach et al. (1995b) tested the 6-year continuities and predictive paths from child/adolescent syndromes (subjects aged 13-16 years) assessed with the Child Behavior Checklist (CBCL; Achenbach, 1991a) to adult syndromes (subjects aged 19-22 years) assessed with the Young Adult Self-Report (YASR) and the Young Adult Behavior Checklist (YABCL; Achenbach, 1997). It was found that several young adult syndromes were strongly predicted by adolescent syndromes. At initial assessment, however, subjects were adolescents, making it not possible to assess the link between childhood and young adulthood functioning.

At an earlier stage of the current study, Ferdinand and Verhulst (1995a) examined the 8-year stability of behavioral and emotional problems from

adolescence into young adulthood. They found that of the individuals aged 13 through 16 years with deviant CBCL total problem scores, 27.3% had deviant YASR Total Problem scores at 8-year follow-up. Again subjects were beyond childhood at the first assessment.

The present study was a sequel to earlier studies on the same sample and was designed to test the 14-year developmental course of a broad range of behavioral and emotional problems in a representative sample of children and adolescents initially aged 4 through 16 years, who were 18 through 30 years at follow-up. The main aims of the present study were (1) to test the long-term continuity of problem behavior, using intrainformant (CBCL/YABCL) and cross-informant (CBCL/ YASR) information, and (2) to investigate the power of different syndromes and demographic variables to predict later problem behavior.

Methods

Population and Procedure

The present study is part of an ongoing longitudinal study that started in 1983 in the Dutch province of Zuid-Holland. A random sample of 2,600 children and adolescents aged 4 to 16 years (100 children of each sex and age) was drawn from municipal registers that list all residents in the province. Of the 2,447 parents reached, 2,076 provided usable CBCLs (84.8%). After the first measurement (1983, time 1), the sample was approached again in 1985 (time 2), 1987 (time 3), 1989 (time 4), 1991 (time 5), and 1997 (time 6). For details on the initial data collection, see Verhulst et al. (1985a; 1985b).

During September 1997 through June 1998, we sought to contact all subjects in the original sample of 2,076, except 8 who had died, 12 who were mentally retarded, 59 who had emigrated, and 14 who had insisted on removal from the sample. Of the subjects who were reached, 36 declined to be interviewed but completed YASRs (Achenbach, 1997) by mail, and 1,582 completed YASRs in home interviews. Of the 1,618 YASRs, 1,615 provided complete information. This comprised 80.9% of the time 1 sample (response rate corrected for deceased subjects, mentally retarded individuals, and subjects who had emigrated).

The 1,618 subjects who provided time 6 YASRs were asked for permission to contact their parents. For 6 subjects, both parents were deceased, while 39 subjects

refused permission. Of the 1,573 parents who were sent a YABCL (Achenbach, 1997), 45 declined participation, 19 gave information that was not usable, and 85 did not respond. Usable YABCLs were obtained from 1,424 (90.5%) parents.

To investigate selective attrition, we compared "drop-outs" (n = 379, with exclusion of those who had died, were mentally handicapped, or had emigrated) and "remainers" (n = 1,618) with respect to age, sex, 1983 CBCL Total Problem scores, and their parents' socioeconomic status (SES) at time 1. SES was assessed using a 6-point scale of parental occupation (Van Westerlaak et al., 1975), with 1 = lowest SES. Drop-outs and remainers did not differ significantly in age distribution (mean age at time 1 was 10.1 years for drop-outs and 9.8 years for remainers; t = -1.23; df = 1995; p = .22); more females responded than males (84.9% versus 77.0%; n = 1,997; χ^2 = 20.22; df = 1; p < .001). Drop-outs and remainers did not differ significantly in the level of time 1 CBCL mean Total Problem scores (21.1 for drop-outs and 20.5 for remainers; t = - .61; df = 1995; p = .54). The mean SES for drop-outs was slightly, though significantly, lower than that for remainers (3.2 for drop-outs and 3.6 for remainers; t = 4.38; df = 586.20; p < .001). The finding that drop-outs did not belong to a group of especially problematic individuals at time 1 supported the representativeness of the sample in the present study. The higher SES for remainers versus drop-outs indicates that remainers may have been subjected to somewhat more favorable environmental circumstances than drop-outs.

Instruments

Child Behavior Checklist. The CBCL (Achenbach, 1991a) is a questionnaire to be completed by parents of 4- to 18-year-olds and can be scored on 8 syndrome scales -Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior- and 2 broad-band groupings of syndromes -Internalizing (consisting of the Withdrawn, Somatic Complaints, and Anxious/Depressed scales), and Externalizing (consisting of the Delinquent and Aggressive Behavior scales). A Total Problem score is derived by summing the individual item scores. Good reliability and validity of the CBCL have been replicated for the Dutch translation (Verhulst et al., 1996).

Young Adult Self-Report and Young Adult Behavior Checklist. The YASR and YABCL (Achenbach, 1997) are upward extensions of the CBCL and have the same response format. Both are designed to evaluate emotional and behavioral problems (plus adaptive functioning and substance abuse on the YASR) for ages 18 years and older. The YASR is filled out by young adults to describe themselves. The YABCL can be completed by parents, parent surrogates, and others who know the subject well (e.g., spouses, partners, or friends). The YASR and YABCL can be scored on 8 syndrome scales -Anxious/Depressed, Withdrawn, Somatic Complaints, Thought Problems, Attention Problems, Intrusive Behavior, Delinquent Behavior, and Aggressive Behavior- and 2 broad-band groupings of syndromes -Internalizing (consisting of the Anxious/Depressed and Withdrawn scales) and Externalizing (consisting of the Intrusive Behavior, Delinquent Behavior, and Aggressive Behavior scales). A Total Problem score is computed by summing the individual item scores. Good reliability and validity for the American YASR and YABCL have been reported by Achenbach (1997). For an earlier and nearly identical version of the Dutch YASR, Ferdinand et al. (1995) reported an 18-day test-retest reliability of $r = 0.89$ for the total problem score, and an average Cronbach α across syndromes of .84. Validity of the Dutch YASR is supported by findings that problem scales showed significant differences between referred and nonreferred young adults (Wiznitzer et al., 1992). For the Dutch YABCL, Heijmens Visser et al. (2000) found an average Cronbach α across syndromes of .81 in a referred sample.

Statistical Analyses

Stability. Stability coefficients between time 1 CBCL and time 6 YASR and YABCL syndrome scores were computed for males and females and two age groups separately (time 1 ages 4-11 years and 12-16 years), with the α level at $p < .05$. Mean stability coefficients were computed, and differences between independent stability coefficients were tested using the Fisher z transformation. We used Cohen's (1988) criteria to evaluate the magnitude of stability coefficients: small ($r = 0.10$-0.29), medium ($r = 0.30$-0.49), or large ($r \geq 0.50$). To assess differences in stabilities for Externalizing versus Internalizing scores, we used Steiger's (1980) method for comparing dependent stability coefficients.

Proportion of Deviant Subjects Who Remained Deviant. To assess the individual course of problem behaviors, we computed the percentage of subjects who could be regarded as deviant using the cutoffs recommended by Achenbach (1991a; 1997). For the CBCL Externalizing, Internalizing, and total problem scores, the cutoff was set at the 82nd percentile, and for the syndrome scales at the 95th percentile. These cutoffs were based on Dutch normative data (Verhulst et al., 1996). The YABCL and YASR cutoffs were based on the cumulative frequency distribution of scores in the present study.

Logistic Regression Analyses. To determine whether individuals with scores indicating deviant behavior on time 1 CBCL syndromes are at risk for specific problems at time 6, we performed forward stepwise logistic regression analyses to identify the best set of predictors. In this way, variables that contributed to the prediction of an outcome variable independently of other variables were entered.

Three sets of regression analyses were performed: one set containing all dichotomized CBCL syndrome scores, one set containing dichotomized Externalizing and Internalizing scale scores, and one set containing dichotomized Total Problem scale scores. Each analysis included age at time 1 (0 = 4-11 years versus 1 = 12-16 years), sex (0 = male, 1 = female), and SES (range 1-6, with 0 = 1-3 versus 1 = 4-6) as candidate predictor variables. All statistical tests were performed with SPSS 8.0 for Windows.

Results

Stability

Table 2.1 gives the intrainformant (CBCL/YABCL) and cross-informant (CBCL/YASR) stability coefficients by age group and sex.

Total Problem Score. The stability coefficients between time 1 CBCL and time 6 YABCL scores were medium, except the stability coefficient for older females (r = 0.54), which was large according to Cohen's (1988) criteria. The stability coefficient for older females was significantly higher than that for younger females and for older males. The CBCL/YASR stability coefficients were significant, though small.

Table 2.1

Stability coefficients between time 1 CBCL scores and time 6 YABCL and YASR scores

	Time 6 YABCL				Time 6 YASR			
	Males (n=670)		Females (n=754)		Males (n=750)		Females (n=865)	
Time 1 CBCL	4-11* (n=437)	12-16 (n=233)	4-11 (n=497)	12-16 (n=257)	4-11 (n=474)	12-16 (n=276)	4-11 (n=549)	12-16 (n=316)
Withdrawn	.29	.40^{O}	.36	.44^{O}	.19	.17^{O}	.07^{a}	.31^{SO,O}
Somatic Complaints	.14	.46^{SO,O}	.18	.35^{SO,O}	.08^{a}	.33^{SO,MO,O}	.08^{a}	.18^{O}
Anxious/Depressed	.32	.37^{O}	.29	.41^{O}	.17	.13	.12	.24
Thought Problems	.12	.09^{a}	.12	.21	.01^{a}	.17^{SO,O}	.00^{a}	.09^{a}
Attention Problems	.34	.35	.28	.37	.06^{a}	.14	.04^{a}	.12
Delinquent Behavior	.20	.30^{O}	.10	.30^{SO,O}	.16^{MY}	.14	-.01^{a}	.24^{SO}
Aggressive Behavior	.33	.25	.37^{F}	.53^{F,SO,FO}	.31	.28	.20	.37^{SO}
Internalizing	.32	.41^{O}	.33	.50^{SO,O}	.19	.13^{O}	.09	.32^{SO,FO,O}
Externalizing	.38	.34	.41	.56^{SO,FO}	.25	.28	.19	.33^{SO}
Total Problem score	.41	.40	.41	.54^{SO,FO}	.23	.26	.13	.28^{SO}

Note. CBCL = Child Behavior Checklist; YABCL = Young Adult Behavior Checklist; time 1 = 1983, time 6 = 1997; a = not significant (p > .05); F = females have significantly higher r values, regardless of age; O = older age group has significantly higher r values, regardless of sex; FO = females have significantly higher r values, within older age group; MY = males have significantly higher r values, within younger age group; SO = older age group has significantly higher r values, within sex. * Age at time 1.

Internalizing and Externalizing Scores. All stability coefficients were significant, and most were small to medium. Older subjects, both females and males, had significantly higher stability coefficients for Internalizing scores than younger subjects. Older females had significantly higher stability coefficients for both Internalizing and Externalizing scores than older males. Stability coefficients between time 1 CBCL and time 6 YABCL Internalizing and Externalizing scores were higher than those between time 1 CBCL and time 6 YASR Internalizing and Externalizing scores.

The stability coefficients of the YABCL Externalizing versus Internalizing scores did not differ significantly for males versus females. However, Externalizing scores were significantly more stable than Internalizing scores in the younger age group, irrespective of sex. On the YASR, Externalizing scores were more stable than Internalizing scores for males, but no significant difference was found for females. Age comparisons showed that Externalizing scores were significantly more stable than Internalizing scores for the younger group, but not for the older group.

Syndrome Scores. According to Cohen's (1988) criteria, CBCL/YABCL stability coefficients were large for the Aggressive Behavior scale in older females ($r = 0.53$) and medium for most other syndrome scores (15/26). Most CBCL/YASR stability coefficients were small (15/19) or not significant. All intrainformant stability coefficients were significant, except for the Thought Problems scale for older males.

Because cross-informant stabilities were substantially and consistently smaller than intrainformant stabilities, we examined the extent of the association of parental information with information given by subjects themselves at time 6. The correlation between YASR and YABCL Total Problem score was 0.44, correlations for the Internalizing and Externalizing scales were 0.46 and 0.41, respectively. We found correlations for syndrome scores ranging from 0.28 (Thought Problems) to 0.48 (Delinquent Behavior).

Proportion of Deviant Subjects Who Remained Deviant

Table 2.2 provides the proportions of subjects scored as deviant at time 1 who could still be regarded as deviant at time 6, on the corresponding scales. Of the subjects with deviant CBCL Total Problem scores at time 1, 38% to 50% (dependent on sex and age group) obtained deviant YABCL Total Problem scores 14 years later.

Table 2.2

Proportion of subjects who were deviant at both time 1 and time 6

	YABCL								YASR							
	Males				Females				Males				Females			
	4-11		12-16		4-11		12-16		4-11		12-16		4-11		12-16	
	%HH	$^{HH}/_{HT1}$	%HH	$^{HH}/_{HT1}$	%HH	$^{HH}/_{HT1}$	%HH	$^{HH}/_{HT1}$	%HH	$^{HH}/_{HT1}$	%HH	$^{HH}/_{HT1}$	%HH	$^{HH}/_{HT1}$	%HH	$^{HH}/_{HT1}$
Withdrawn	22	6/27	46	5/11	27	8/30	33	4/12	21	6/28	23	3/13	6	2/35	37	7/19
Somatic Complaints	8	1/13	46	6/13	8	2/25	29	2/7	14	2/14	33	5/15	10	3/29	8	1/12
Anxious/Depressed	16	5/31	17	2/12	19	6/31	38	3/8	3	1/31	7	1/14	13	5/39	33	4/12
Thought Problems	21	3/14	0	0/2	0	0/7	33	1/3	27	4/15	67	2/3	13	1/8	0	0/4
Attention Problems	21	7/33	13	4/30	26	7/27	38	6/16	11	4/35	9	3/33	9	3/35	10	2/20
Delinquent Behavior	17	8/47	22	2/9	27	9/33	33	2/6	16	8/51	17	2/12	0	0/36	27	3/11
Aggressive Behavior	18	7/40	5	1/22	23	10/43	33	4/12	17	7/42	14	4/28	14	7/50	19	3/16
Internalizing	34	33/98	53	18/34	33	30/91	54	19/35	29	30/105	32	12/37	20	21/105	43	19/44
Externalizing	44	42/95	37	17/46	42	43/102	52	17/33	30	31/102	26	14/55	34	40/119	33	15/46
Total Problem score	39	42/108	45	19/42	38	36/95	50	17/34	30	35/115	33	17/51	30	34/114	21	9/44

Note. YABCL = Young Adult Behavior Checklist, YASR = Young Adult Self-Report; time 1 = 1983; time 6 = 1997; $^{HH}/_{HT1}$ = number of subjects scored in the deviant range at time 1 and time 6, on corresponding scales/number of subjects scored in the deviant range at time 1; %HH = percentage of subjects initially classified as deviant who were deviant at time 6.

Furthermore, 21% to 33% of those with deviant CBCL Total Problem scores at time 1 rated themselves in the deviant range on the YASR Total Problem score at time 6. Most scores for older subjects showed higher continuity than those for younger subjects. In addition, we traced individuals with CBCL Total Problem scores at time 1 in the normal range, separately for sex and two age groups. Of these individuals, 11% (males, age group 12-16 years), 13% (both males and females, age group 4-12 years), and 14% (females, age group 12-16 years) obtained YABCL Total Problem scores in the deviant range at follow-up, and 12% (females, age group 12-16 years), 13% (males, age group 12-16 years), 18% (males, age group 4-11 years), and 19% (females, age group 4-11 years) rated themselves in the deviant range on the YASR Total Problem score 14 years later.

Table 2.3

Associations between deviant time 1 CBCL scores and deviant YABCL/YASR scores at follow-up

Predictors time 1, CBCL	Outcome time 6					
	Internalizing		Externalizing		Total Problem score	
	YABCL	YASR	YABCL	YASR	YABCL	YASR
Internalizing	2.8 (2.0-3.9)	1.6 (1.2-2.2)	2.0 (1.4-2.8)	-	2.8 (2.0-3.8)	1.9 (1.4-2.5)
Externalizing	1.5 (1.1-2.1)	1.5 (1.1-2.1)	3.3 (2.4-4.5)	2.4 (1.8-3.1)	2.8 (2.0-3.8)	1.5 (1.1-2.0)
Age	-	-	-	0.6 (0.4-0.7)	-	0.7 (0.5-0.9)

Note. All data are given as odd ratios (95% confidence intervals) derived from multiple logistic regression analysis (forward stepwise), significance level $\alpha = .05$; only significant results are presented. CBCL = Child Behavior Checklist; YABCL = Young Adult Behavior Checklist; YASR = Young Adult Self-Report; time 1 = 1983; time 6 = 1997. Age: 0 = 4-11 years, 1 = 12-16 years (time 1).

Logistic Regression Analyses

Total Problem Score. Time 6 YABCL and YASR Total Problem scores were predicted by CBCL Total Problem scores at time 1 (odds ratio = 4.6, 95% confidence interval 3.4-6.2, and 2.1, 95% confidence interval 1.6-2.8), independently of sex and SES, with older subjects having a lower probability of being scored in the deviant range on the YASR at time 6 (odds ratio = 0.7, 95% confidence interval 0.5-0.9). Table 2.3 shows that scores on the CBCL Internalizing

and Externalizing scales predicted time 6 YABCL Total Problem scores. Time 6 YASR Total Problem scores were predicted by the Internalizing and Externalizing scales, with younger subjects having a higher probability of being scored in the deviant range.

As can be seen from Table 2.4, time 1 CBCL scores on the Withdrawn, Social Problems, Delinquent Behavior, and Aggressive Behavior scales predicted time 6 YABCL Total Problem scores. For time 6 YASR total problem scores, the time 1 CBCL Anxious/Depressed, Thought Problems, and Delinquent Behavior scales were the best predictors, with younger subjects having a higher probability of being deviant at time 6.

Internalizing and Externalizing. Table 2.4 shows that time 1 CBCL Withdrawn, Anxious/Depressed, and Social Problems scores predicted time 6 YABCL Internalizing scores. For time 6 YASR Internalizing scores, the time 1 Anxious/ Depressed and Aggressive Behavior scores were the best predictors. Time 6 YABCL Externalizing scores were best predicted by the CBCL Withdrawn, Anxious/Depressed, Delinquent Behavior, and Aggressive Behavior syndromes. For YASR Externalizing scores, the time 1 CBCL Anxious/Depressed, Thought Problems, and Aggressive Behavior syndromes were the best predictors, with older subjects having a lower probability of being scored in the deviant range at follow-up.

Syndrome Scores. As can be seen in Table 2.4, scores in the deviant range on either YABCL syndromes or YASR syndromes were often predicted by more than one CBCL syndrome. For instance, YABCL Anxious/Depressed scores were predicted not only by time 1 Anxious/Depressed syndrome scores, but also by Social Problem syndrome scores. The YASR Aggressive Behavior scores were predicted not only by time 1 Delinquent Behavior, but also by Anxious/Depressed and Thought Problems syndrome scores.

Discussion

Continuity and Prediction of Psychopathology

The 14-year intrainformant stability (CBCL/YABCL; mean $r = 0.43$) for Total Problem scores found in the present study can be considered medium according to Cohen's (1988) criteria and is slightly lower than the 8-year stability reported by

Table 2.4

Associations between deviant time 1 CBCL scores and deviant YABCL/YASR scores at follow-up

Predictors	Outcome time 6							
Time 1,	Withdrawn		Somatic Complaints		Anxious/Depressed		Thought Problems	
CBCL	YABCL	YASR	YABCL	YASR	YABCL	YASR	YABCL	YASR
Withdrawn	8.2 (4.7-14.1)	2.5 (1.4-4.7)	-	-	-	-	-	-
Somatic Complaints	-	-	4.2 (2.0-8.7)	2.2 (1.1-4.4)	-	-	-	-
Anxious/Depressed	-	-	-	-	2.2 (1.1-4.4)	-	-	2.6 (1.5-4.2)
Social Problems[a]	-	2.1 (1.1-3.9)	-	-	3.5 (1.8-7.0)	2.4 (1.2-4.7)	2.7 (1.4-5.0)	-
Thought Problems	-	-	3.7 (1.2-10.9)	-	-	-	-	-
Attention Problems	-	-	2.2 (1.2-4.4)	-	-	-	-	-
Delinquent Behavior	-	-	-	2.8 (1.6-4.8)	-	2.3 (1.2-4.5)	-	-
Aggressive Behavior	-	-	-	-	-	-	2.7 (1.6-4.7)	-
Sex	-	-	-	-	-	-	-	-
Age	-	-	1.7 (1.1-2.8)	-	-	-	-	0.6 (0.4-0.9)

Table 2.4 continues

Table 2.4 (continued)

Predictors, time 1, CBCL	Outcome time 6							
	Attention Problems		Intrusive Behavior		Delinquent Behavior		Aggressive Behavior	
	YABCL	YASR	YABCL	YASR	YABCL	YASR	YABCL	YASR
Withdrawn	5.3 (2.4-9.9)	-	-	-	-	-	3.3 (1.7-6.3)	-
Somatic Complaints	-	-	-	-	-	-	-	-
Anxious/Depressed	-	-	-	-	-	3.0 (1.6-5.5)	-	2.3 (1.3-3.9)
Social Problems[a]	2.5 (1.2-5.4)	2.4 (1.3-4.3)	-	-	2.1 (1.1-3.9)	-	-	-
Thought Problems	-	-	-	-	-	-	-	3.9 (1.6-9.4)
Attention Problems	2.4 (1.2-4.8)	-	2.3 (1.2-4.2)	-	-	-	-	-
Delinquent Behavior	-	-	-	-	3.3 (1.9-5.8)	-	-	2.5 (1.4-4.7)
Aggressive Behavior	-	-	3.6 (2.1-6.2)	1.8 (1.1-3.0)	-	-	4.3 (2.4-7.6)	-
Sex	-	-	2.2 (1.4-3.3)	0.6 (0.4-0.9)	2.4 (1.6-3.6)	-	-	-
Age	-	-	0.5 (0.3-0.9)	0.6 (0.4-0.9)	-	0.6 (0.4-0.98)	-	-

Table 2.4 continues

Table 2.4 (continued)

Predictors time 1, CBCL	Outcome time 6					
	Internalizing		Externalizing		Total Problem score	
	YABCL	YASR	YABCL	YASR	YABCL	YASR
Withdrawn	2.6 (1.6-4.3)	-	1.9 (1.1-3.1)	-	2.7 (1.6-4.5)	-
Somatic Complaints	-	-	-	-	-	-
Anxious/Depressed	1.8 (1.1-3.1)	1.9 (1.2-3.1)	1.8 (1.1-3.1)	1.7 (1.1-2.8)	-	1.9 (1.2-3.6)
Social Problems[a]	2.3 (1.3-3.9)	-	-	-	2.0 (1.2-3.4)	-
Thought Problems	-	-	-	2.2 (1.0-4.9)	-	2.7 (1.3-5.8)
Attention Problems	-	-	-	-	-	-
Delinquent Behavior	-	-	2.2 (1.3-3.6)	-	2.1 (1.2-3.4)	1.6 (1.0-2.5)
Aggressive Behavior	-	1.7 (1.1-2.6)	2.3 (1.5-3.7)	1.7 (1.1-2.7)	2.6 (1.7-4.2)	-
Sex	-	-	-	-	-	-
Age	-	-	-	0.6 (0.4-0.7)	-	0.7 (0.5-0.9)

Note. All data are given as odds ratios (95% confidence interval), derived from multiple logistic regression analysis (forward stepwise), significance level $\alpha = .05$; only significant results are presented. CBCL = Child Behavior Checklist; YABCL = Young Adult Behavior Checklist; YASR = Young Adult Self-Report; time 1 = 1983; time 6 = 1997. Sex: male = 0, female = 1. Age: 0 = 4-11 years, 1 = 12-16 years (time 1). [a] No counterpart in YABCL or YASR.

Verhulst and Van der Ende (1995) for the same sample initially aged 4 to 10 years and assessed with the CBCL (r = 0.48). For the cross-informant Total Problem scores (CBCL/YASR), the mean long-term stability was lower (r = 0.22).

At a categorical level, we found that 41% of the subjects who obtained deviant CBCL Total Problem scores at time 1 also obtained deviant YABCL Total Problem scores at time 6, while 29% obtained deviant YASR Total Problem scores at time 6, with higher continuity for older than for younger subjects. Although a substantial proportion of the initially deviant subjects seemed to recover, 65% according to YASR information at time 6 and 78% according to YABCL information at time 6 obtained scores above the 50th percentile of the Total Problem score frequency distribution at follow-up.

The continuity of problem behaviors in the current study was lower than that reported by Feehan et al. (1993), who found that 63% of subjects from a birth cohort who had a disorder at age 15 still had a disorder at age 18. However, the follow-up period in the study by Feehan et al. (1993), was much shorter than the 14 years in our study. Cohen et al. (1993a), in their 2 ½-year follow-up of a random sample of children from the general population (n = 734), reported that 23% to 56% of the subjects with a disordered at ages 9 to 18 years had the same disorder at follow-up.

The lower predictability of cross-informant (CBCL/YASR) versus intra-informant (CBCL/YABCL) scores found in all our analyses can be attributed to the use of different informants (parents at time 1 versus self-report at follow-up). In a meta-analysis, Achenbach et al. (1987) found that the mean correlation between problem scores derived concurrently from parents and subjects themselves was 0.25. We found correlations between YABCL and YASR scale scores at time 6 ranging from 0.28 to 0.48. Thus, given the different types of informant and the long time interval, it was remarkable that both for continuous scores and categories, time 1 CBCL scores significantly predicted time 6 YASR scores.

The present study was not designed to identify factors that may explain why some individuals remained problematic while others seemed to recover. However, we were able to indicate which types of initial problems were predictors of deviance 14 years later. We found that the time 1 Internalizing scale Withdrawn was predictive of both adult Internalizing and Externalizing scales, and that the time 1 Externalizing scale Delinquent Behavior was predictive of both adult Externalizing

and Internalizing scales. Similarly, we found that most time 6 syndromes were predicted by more than one time 1 syndrome. These findings illustrate the constructs of multifinality (i.e., dispersion of outcomes) and equifinality (i.e., diversity of pathways may lead to common outcomes) as described by Cicchetti (1990). The finding of dispersion of outcomes extends earlier findings by McGee et al. (1991), who found hyperactivity at the age of 3 to be a risk factor for adolescent disorder in general, rather than just for adolescent hyperactivity. The finding that a diversity of pathways may lead to common outcomes extends the findings by Offord et al. (1992), who found that emotional disorder, conduct disorder, and hyperactivity in 4- to 12-year-olds from the general population predicted emotional disorder 4 years later to a similar degree.

Among the complex divergent and convergent relations between syndrome scores across time, a number of predictive relations emerged as especially marked. Of all time 1-time 6 associations, the Withdrawn-Withdrawn (CBCL/YABCL) prediction was the strongest. Across YABCL and YASR outcomes, the CBCL Social Problems syndrome was the most frequent predictor. Our results showed that externalizing behaviors did not surpass internalizing behaviors in their ability to predict adult psychopathology, whereas in similar studies, pertaining to younger ages, externalizing behaviors are found to be better predictors of psychopathology than internalizing behaviors. For example, Offord et al. (1992) found that conduct disorder was the strongest predictor of later psychopathology.

Adolescence as Turning Point?

Existing studies either focussed on one specific type of psychopathology (e.g., depression; Angold et al., 1998) or did not span wide enough developmental periods to compare stabilities of problems between subjects who had and those who had not yet entered adolescence at initial assessment. We found that several stability coefficients were significantly higher for subjects who were adolescents (12-16 years) at time 1 than for subjects who were children (4-11 years). This finding was most striking for females. The CBCL and YACBL Total Problem scores, Internalizing and Externalizing scales, and the Somatic Complaints, Delinquent Behavior, and Aggressive Behavior syndromes showed significantly higher stabilities for older versus younger females. For males, only the CBCL/YABCL

Somatic Complaints syndrome showed higher stability for older than for younger subjects. When looking at the cross-informant stabilities (CBCL/YASR), the findings showed a similar pattern. For older females, Total Problem scores, Internalizing and Externalizing scales, and the Withdrawn, Delinquent Behavior, and Aggressive Behavior syndromes showed significantly higher stabilities than for younger females. For males, only the Somatic Complaints and Thought Problems syndromes showed higher stability for subjects who were adolescents at time 1. Because the pattern was more striking for females than for males, and because it is known that females reach puberty at an earlier age than males (Laitinen-Krispijn et al., 1999), we computed stability coefficients for age groups 4 to 13 years and 14 to 16 years for males and compared them with the stabilities as reported in the "Results" section. However, this analysis yielded comparable stabilities for these different age groups. From these findings it is clear that subjects who were children at time 1, and who still had to pass through adolescence on their way into adulthood, showed less stability of problem behaviors than subjects who were adolescents at initial assessment. This conclusion is broadly consistent with findings by Feehan et al. (1995), who found that when subjects had a disorder in adolescence, the effects of earlier, preadolescent mental health problems on the persistence of disorder to the age of 18 years were negligible. However, to test fully the role of adolescence further research is needed.

Parents as Informants of Adult Behavior

In the analyses of CBCL/YABCL continuity, parents were used as informants at both initial assessment and follow-up. It may be argued that parents are not capable of accurately reporting the problem behaviors of their adult children, many of whom live away from the parental home. Also, it may be argued that the long-term stability of parent-reported problems as reported in the present study reflects parental insensitivity to change in the child's functioning. To test these possible sources of error, we compared the time 6 YABCL/YASR correlation of Total Problem scores for subjects who were not living with their parents (70% of the sample) versus the correlation for the 30% who still lived in the parental home. For both groups the YABCL/YASR correlation was 0.44.

Limitations

The main limitation of the current study, shared with other longitudinal studies, is the question concerning generalizability of findings, despite the fact that our data did not suggest selective attrition. Furthermore, historical aspects were not taken account of. The period in which the subjects grew up might have influenced the rates of psychopathology. Finally, because we did not include standardized information on treatment and help-seeking during the years of follow-up, we do not know the effect of possible interventions on the course of problem behaviors from childhood into adulthood. Furthermore, possible gender and age differences in help-seeking behavior, and consequently gender and age differences in receiving treatment, may have influenced the outcome selectively.

Conclusions and Clinical Implications

We found considerable continuity of behavioral and emotional problems across a 14-year period, although the majority of deviant subjects did not remain deviant. Parent-reported problems showed considerable stability and cross-informant stability was, although small, significant as well. Parent-reported withdrawal and social problems appeared to be especially important predictors of adult malfunctioning. The present study underscores these problems as an important focus for intervention, although no direct equivalent DSM-IV (American Psychiatric Association, 1994) Axis I categories exist. Our findings underscore the importance of the use of DSM-IV Axis V, in which social problems are represented, for predicting behavioral outcomes.

An interesting finding was that, especially in females, those subjects who were children at initial assessment showed less stability of problem behaviors than subjects who were already adolescents at initial assessment. The positive message which follows from these findings is that preadolescent children who have problems may step out of a trajectory leading to adult deviance when they go through adolescence. The negative message is that the probability of staying in a trajectory leading to deviance in adulthood seems to be relatively high for those who showed problems in adolescence.

The current study was unique in that it used parents as informants to assess problem behaviors in adults. In adult psychiatric literature, it is not common to use

parents as informants on subjects' functioning, whereas in child psychiatry it is now standard to use information from multiple informants, including parents, teachers, and youngsters themselves to assess psychopathology. The findings showed that parental information is a feasible source of information on adult subjects' functioning.

3 Child and Adolescent Problems Predict DSM-IV Disorders in Adulthood: A 14-year Follow-Up of An Epidemiological Sample

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Chapter 3

Child and Adolescent Problems Predict DSM-IV Disorders in Adulthood: A 14-year Follow-Up of an Epidemiological Sample

Abstract

Objective: *Few studies exist that examined continuities between child and adult psychopathology in unselected samples. This study prospectively examined the adult outcomes of psychopathology in an epidemiological sample of children and adolescents across a 14-year period.* ***Method:*** *For 1,578 4- to 16-year-olds from the general population, parent ratings of behavioral and emotional problems were obtained in 1983. At follow-up, 14 years later, subjects were reassessed with a standardized DSM-IV interview.* ***Results:*** *High levels of childhood problems predicted an approximate 2- to 6-fold increased risk for adulthood DSM-IV diagnoses. The associations between specific childhood problems and adulthood diagnoses were complex, with both homotypic and heterotypic continuities. Attention Problems in childhood did not predict adulthood disorders. Delinquent Behavior in boys predicted both mood disorders and disruptive disorders in adulthood.* ***Conclusions:*** *Childhood behavioral and emotional problems predict DSM-IV diagnoses in adulthood. The strongest predictor of disorders in adulthood were childhood oppositional behaviors. Attention Problems did not predict any of the DSM-IV categories when adjusted for the associations with other CBCL scales.*

Introduction

Studies concerning the links between child and adult psychopathology are of importance both from theoretical and clinical point of view (for brevity we use child to include adolescent). Theoretically because it is argued that the origins of some adult forms of psychopathology can be found in childhood, and clinically because these studies are needed to determine the need for intervention and prevention. Despite its importance, knowledge in this area is hampered by a number of methodological limitations, including: the reliance on clinical samples which have limited generalizability as a result of referral bias (Caron and Rutter, 1991); the use of retrospective designs with its possible distortions in reporting or recall

(Verhulst, 1995); and the focus on single disorders without taking account of comorbidity (Caron and Rutter, 1991).

Among prospective community studies of relations between child and adult psychopathology, few pertained to a broad range of psychopathology (Achenbach et al., 1995b; Caspi et al., 1996; Ferdinand and Verhulst, 1995a). Achenbach et al. (1995b) in a 6-year follow-up, tested the continuities and predictive paths from adolescent syndromes (subjects aged 13-16 years) to adult syndromes (subjects aged 19-22 years) using parent and self-report versions of the Child Behavior Checklist (CBCL; Achenbach, 1991a) The authors reported that several young adult syndromes were strongly predicted by their adolescent counterparts. Ferdinand and Verhulst (1995a), at an earlier stage of the current study, examined the 8-year stability of behavioral and emotional problems from adolescence into young adulthood. They found that of the adolescents aged 13 through 16 years with parent reported CBCL Total Problem scores in the deviant range, 27.3% had Young Adult Self-Report (YASR; Achenbach, 1997) Total Problem scores in the deviant range at 8-year follow-up. Caspi et al. (1996) in the Dunedin birth cohort study, tested whether behavioral observations at age 3 were predictive of psychiatric disorders at age 21, as assessed with the Diagnostic Interview Schedule (DIS; Robins et al., 1981). Based on behavioral observations, 3-year-olds were classified as under-controlled, inhibited, well-adjusted, confident, or reserved. Undercontrolled children were more likely to meet diagnostic criteria for antisocial personality disorder in adulthood, and inhibited children were more likely to meet diagnostic criteria for depression in adulthood.

Other prospective community studies focussed on narrower areas of psycho-pathology (Fleming et al., 1993; Moffitt et al., 1996; Pine et al., 1998). Pine et al. (1998), in a 9-year follow-up of 9- to 18-year-olds, found that adolescent anxiety and depressive disorders, as assessed with the Diagnostic Interview Schedule for Children (DISC; Costello et al., 1985) predicted anxiety and depressive disorders in adulthood. The associations were both homotypic and heterotypic (depression in adolescence predicted both depression and anxiety disorders in adulthood, and anxiety disorders in adolescence predicted both anxiety disorders and depression in adulthood). Fleming et al. (1993), in a 4-year follow-up of adolescents aged 13 to 16 at initial assessment, found that of the adolescents with conduct disorder, 12.5% met

criteria for antisocial personality disorder 4 years later. Moffitt et al. (1996), in a 15-year follow-up of the Dunedin birth cohort, found antisocial conduct problems in males with onset in childhood to show more continuity into young adulthood than antisocial conduct problems with onset in adolescence.

The present study concerns the 14-year follow-up of behavioral and emotional problems in 1,578 subjects randomly selected from the Dutch general population, initially aged 4-16 years. An earlier report pertained to the prediction of questionnaire scores on the Young Adult Behavior Checklist (YABCL; Achenbach, 1997) and the Young Adult Self-Report (YASR; Achenbach, 1997) from Child Behavior Checklist (CBCL; Achenbach, 1991a) scores obtained 14 years earlier from the parents (Hofstra et al., 2000). We found that initial parent reported problems were important predictors of adult psychopathology assessed with rating scales.

The main aim of the present study was to predict DSM-IV (American Psychiatric Association, 1994) diagnoses in 18-30 year-olds from parent reported problems obtained with the CBCL 14 years earlier. The extended follow-up interval of 14 years, and the use of standardized procedures to assess a broad range of childhood behavioral and emotional problems, enabled us to test which particular childhood problems are differentially linked to specific DSM-IV diagnoses in adulthood.

Methods

Population and Procedure

The present study was part of an ongoing longitudinal general population study, which started in 1983 in the Dutch province of Zuid-Holland. For details on the initial data collection, see Verhulst et al. (1985a; 1985b), and on the procedures of the present study, see Hofstra et al. (2000).

We focussed here on the 1,578 subjects who provided DSM-IV information at follow-up (1997), and who comprised 79.0% of the 2,076 subjects at initial assessment in 1983. The response rate was corrected for deceased subjects, mentally retarded individuals, and subjects who had emigrated.

"Dropouts" (i.e., all subjects for whom no DSM-IV information was obtained; $n = 419$, with exclusion of those who had died ($n = 8$), had severe mental handicaps ($n = 12$) or had emigrated ($n = 59$)) had 1983 CBCL Total Problem scores similar to

those of the "remainers" (those who did cooperate; n = 1578) (mean = 21.1 for dropouts and 20.5 for remainers; t = - .64; df = 1995; p = .53). The mean socio-economic status, assessed with a six-point scale of parental occupation (Van Westerlaak et al., 1975), for dropouts was slightly, though significantly, lower than that for remainers (3.2 for dropouts and 3.6 for remainers; t = 4.95; df = 683; $p < .001$), and more females than males responded (83.1% versus 74.7%; n = 1,997; $\chi^2 = 21.12$; $df = 1$; $p < .001$).

Instruments

Initial Assessment of Behavioral and Emotional Problems in Children

At initial assessment the Child Behavior Checklist (CBCL/4-18; Achenbach, 1991a) was used to obtain standardized parent reports of children's problem behaviors. The CBCL contains 120 problem items. Each item is scored 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true, based on the preceding 6 months. Internalizing is the sum of scores on items in the Withdrawn, Somatic Complaints, and Anxious/Depressed scales, and Externalizing is the sum of scores on the Delinquent Behavior and Aggressive Behavior scales (Achenbach, 1991a). The other syndrome scales of the CBCL are Social Problems, Thought Problems, and Attention Problems. Good reliability and validity of the CBCL have been replicated for the Dutch translation (Verhulst et al., 1996).

Assessment of DSM-IV Psychiatric Diagnoses of Adults at Follow-Up

The computerized version of the Composite International Diagnostic Interview (CIDI; World Health Organization, 1992) and three sections of the Diagnostic Interview Schedule (DIS; Robins et al., 1997) were used to obtain diagnoses of mental disorder in the 12 months prior to the interview. The CIDI and DIS are fully structured interviews to allow administration by lay interviewers and scoring of diagnoses by computer. The CIDI has some 300 questions chosen to cover the criteria for DSM-IV (American Psychiatric Association, 1994) diagnoses. Good reliability and validity have been reported for the CIDI (Andrews and Peters, 1998). Because information concerning disruptive disorders in adulthood (oppositional defiant, antisocial personality disorder, and attention deficit hyperactivity disorder) is lacking in the CIDI, sections of the DIS covering these disorders were translated

into Dutch and administered. Each CIDI-DIS interview was conducted by an interviewer, trained by the Dutch World Health Organization (WHO) training center for the CIDI.

Because the cell sizes for specific disorders were small for the majority of diagnoses, we constructed the following groupings of DSM-IV categories: (1) *anxiety disorders*, consisting of generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, agoraphobia, social phobia, specific phobia, or any combination of these disorders; (2) *mood disorders*, consisting of major depressive episode, bipolar disorder, dysthymia, or any combination of these disorders; (3) *substance abuse/dependence*, consisting of alcohol abuse/dependence, drug abuse/dependence, or both; (4) *disruptive disorders*, consisting of oppositional defiant disorder, antisocial personality disorder, attention deficit hyperactivity disorder, attention deficit only, hyperactivity only, or any combination of these disorders; and (5) *any disorder*, consisting of anxiety disorders, mood disorders, substance abuse/dependence, disruptive disorders, and other disorders such as bulimia nervosa, somatization, conversion, pain disorder, hypochondriasis, and brief psychotic disorder, or any combination of these disorders.

Statistical Analyses

Large prevalence differences of DSM-IV disorders for males versus females were present in the current study. Therefore analyses were performed for males and females separately.

To select individuals who could be regarded as deviant at time 1 on the basis of their CBCL scores, cutoff points as recommended by Achenbach (1991a) were used. For the CBCL Externalizing, Internalizing, and Total Problem scores, the cutoff was set at the 82nd percentile, and for the syndrome scales at the 95th percentile of the cumulative frequency distributions of these scales for a Dutch normative sample (Verhulst et al., 1996). Contingency tables were used to determine the univariate associations between proportions of individuals scoring in the deviant versus normal range at time 1 (1983) and groupings of DSM-IV diagnoses at time 6 (1997).

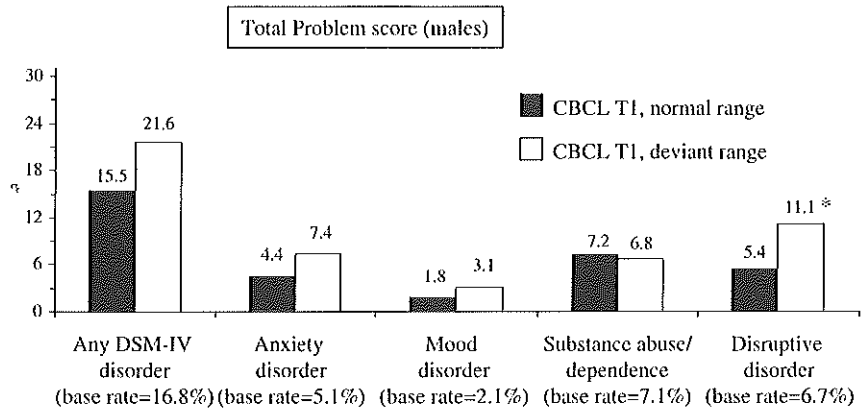

Fig 3.1 DSM-IV disorders in adulthood for those with scores in the normal range or in the deviant range on the CBCL Total Problem score for males (n = 731). *significant ($p < .05$) difference in prevalences for childhood scores in the normal range and in the deviant range was found.

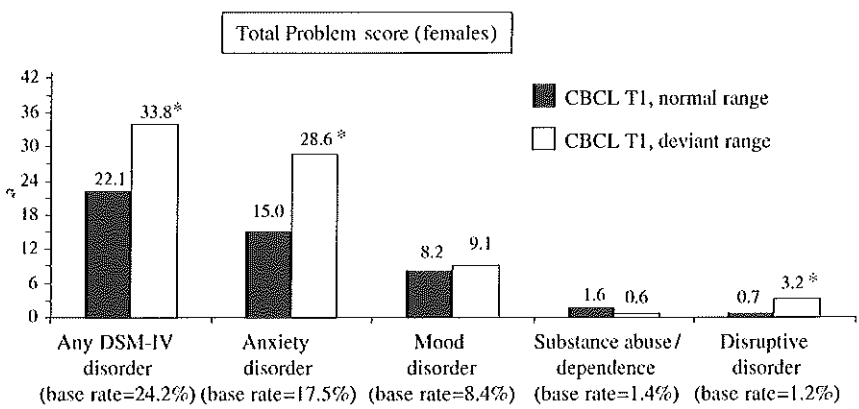

Fig. 3.2 DSM-IV disorders in adulthood for those with scores in the normal range or in the deviant range on the CBCL Total Problem score for females (n = 847). *significant ($p < .05$) difference in prevalences for childhood scores in the normal range and in the deviant range was found.

Multivariate logistic regressions were used to determine which time 1 CBCL syndrome scales predicted specific groupings of adult psychiatric disorder. Three sets of analyses, using a forward stepwise approach, were performed, separately for each sex: one set containing eight dichotomized CBCL scales, one set containing dichotomized Externalizing and Internalizing scales, and one set containing dichotomized Total Problem scores. Each analysis included age at time 1 (0 = 4-11 years versus 1 = 12-16 years) and time 1 parental socioeconomic status (range 1-6, with 1 = low (1,2,3) versus 0 = high (4,5,6)), as candidate predictor variables. All statistical tests were performed by SPSS 8.0 for Windows.

Results

Longitudinal Predictions

Figures 3.1 and 3.2 show the 12-month prevalences of 4 groups of DSM-IV disorders and of any DSM-IV disorder for adults who had CBCL Total Problem scores in the deviant range at time 1, and the prevalences for individuals with CBCL Total Problem scores in the normal range at time 1, separately for males and females. The sample base rate for each disorder is indicated. A consistent finding, was that individuals with scores in the deviant range in childhood, have higher prevalences of psychiatric disorders 14-years later, compared to individuals with scores in the normal range at time 1, except for substance abuse/dependence.

Univariate Associations

Table 3.1 provides the odds ratios and 95% confidence intervals for associations between the CBCL Total Problem, Internalizing, and Externalizing scales and DSM-IV disorders. CBCL Total Problem scores in the deviant range, predicted any DSM-IV disorder, anxiety disorders, and disruptive disorders in females. In males, only disruptive disorders were predicted by CBCL Total Problem scores.

Scores in the deviant range on the CBCL Externalizing scale predicted any DSM-IV disorder and anxiety disorders in females but not in males. Both in females and males, the Externalizing scale predicted disruptive disorders. The Internalizing scale predicted anxiety disorders in females, and mood disorders in males.

Table 3.2 shows the results of the univariate analyses for associations between CBCL syndrome scales and DSM-IV disorders.

Table 3.1

Associations between childhood emotional and behavioral problems and adult DSM-IV disorders

Childhood predictors, (CBCL)	No. of cases (M-F)[A]	Adult diagnosis at time 6 (1997)					
		Any DSM disorder		Anxiety disorders		Mood disorders	
		Males (n=123)	Females (n=205)	Males (n=37)	Females (n=148)	Males (n=15)	Females (n=71)
Total Problem score	162-154	1.5 (0.97-2.3)	1.8 (1.2-2.6)*	1.7 (0.9-3.6)	2.3 (1.5-3.4)*	1.8 (0.6-5.3)	1.1 (0.6-2.1)
Internalizing	138-146	1.5 (0.9-2.4)	1.4 (0.9-2.1)	1.2 (0.5-2.7)	1.6 (1.1-2.5)*	5.2 (1.8-14.5)*	1.5 (0.8-2.6)
Externalizing	152-160	1.5 (0.96-2.4)	2.0 (1.4-2.9)*	1.7 (0.8-3.4)	2.4 (1.6-3.6)*	1.9 (0.7-5.8)	1.4 (0.8-2.5)

Childhood predictors, (CBCL)	No. of cases (M-F)[A]	Adult diagnosis at time 6 (1997)			
		Substance abuse/dependence		Disruptive disorders	
		Males (n=52)	Females (n=12)	Males (n=49)	Females (n=10)
Total Problem score	162-154	0.9 (0.5-1.9)	0.4 (0.1-3.2)	2.2 (1.2-4.0)*	4.6 (1.3-16.2)*
Internalizing	138-146	1.5 (0.8-2.9)	0.96 (0.2-4.4)	1.4 (0.7-2.8)	2.1 (0.5-8.1)
Externalizing	152-160	0.9 (0.4-1.8)	0.4 (0.1-3.0)	2.0 (1.04-3.6)*	10.4 (2.7-40.8)*

Note. NE indicates that odds ratios were not estimable when the contingency table contained an empty cell. [A] Number of cases in childhood, for males (M) and females (F). * $p < .05$.

Table 3.2

Associations between childhood emotional and behavioral problems and adult DSM-IV disorders

Childhood predictors, (CBCL)	No. of cases (M-F)[A]	Adult diagnosis at time 6 (1997)					
		Any DSM disorder		Anxiety disorders		Mood disorders	
		Males (n=123)	Females (n=205)	Males (n=37)	Females (n=148)	Males (n=15)	Females (n=71)
Withdrawn	39-53	0.7 (0.3-1.9)	0.7 (0.4-1.5)	NE	0.97 (0.9-1.1)	1.3 (0.2-10.0)	0.9 (0.3-2.5)
Somatic Complaints	28-40	0.7 (0.7-4.1)	1.7 (0.9-3.4)	0.7 (0.1-5.2)	2.1 (1.1-4.3)*	4.1 (0.9-19.0)	0.9 (0.3-2.9)
Anxious/Depressed	44-50	1.7 (0.8-3.5)	1.8 (1.0-3.3)*	0.9 (0.2-3.8)	1.9 (1.0-3.7)*	4.1 (1.1-15.2)*	1.9 (0.8-4.3)
Social Problems	37-56	1.4 (0.6-3.1)	2.2 (1.2-3.8)*	1.1 (0.3-4.7)	2.2 (1.2-4.0)*	3.0 (0.7-13.8)	1.9 (0.9-4.3)
Thought Problems	18-12	1.9 (0.7-5.5)	1.1 (0.3-3.9)	NE	1.1 (0.8-1.5)	NE	1.0 (0.84-1.2)
Attention Problems	67-55	1.2 (0.6-2.3)	1.2 (0.6-2.2)	0.6 (0.1-2.4)	1.4 (0.7-2.6)	1.5 (0.3-7.0)	1.1 (0.4-2.9)
Delinquent Behavior	59-46	2.6 (1.2-4.7)*	1.6 (0.8-2.9)	1.9 (0.7-5.0)	2.2 (1.1-4.2)*	6.1 (2.0-18.6)*	1.0 (0.4-3.0)
Aggressive Behavior	67-66	1.4 (0.7-2.5)	1.2 (0.7-2.1)	1.2 (0.4-3.5)	1.6 (0.9-2.9)	1.5 (0.3-7.0)	0.9 (0.4-2.3)

Table 3.2 continues

Table 3.2 (continued)

Childhood predictors, (CBCL)	No. of cases (M-F)[A]	Adult diagnosis at time 6 (1997)			
		Substance abuse/dependence		Disruptive disorders	
		Males (n=52)	Females (n=12)	Males (n=49)	Females (n=10)
Withdrawn	39-53	1.1 (0.3-3.7)	1.4 (0.2-10.8)	0.7 (0.2-3.2)	NE
Somatic Complaints	28-40	3.0 (1.1-8.3)*	NE	1.7 (0.5-5.9)	2.3 (0.3-18.4)
Anxious/Depressed	44-50	1.3 (0.5-3.9)	3.3 (0.7-15.4)	4.2 (1.9-9.2)*	1.8 (0.2-14.4)
Social Problems	37-56	0.7 (0.2-3.2)	2.9 (0.6-13.5)	2.3 (0.9-6.2)	3.6 (0.8-17.5)
Thought Problems	18-12	2.7 (0.8-9.7)	6.8 (0.8-57.4)	4.2 (1.3-13.4)*	NE
Attention Problems	67-55	0.8 (0.3-2.3)	3.0 (0.6-13.8)	2.4 (1.1-5.2)*	1.6 (0.2-13.0)
Delinquent Behavior	59-46	1.5 (0.6-3.8)	NE	4.4 (2.1-9.0)*	2.0 (0.2-15.8)
Aggressive Behavior	67-66	1.1 (0.4-2.8)	1.1 (0.1-8.5)	2.4 (1.1-5.2)*	1.3 (0.2-10.6)

Note. NE indicates that odds ratios were not estimable when the contingency table contained an empty cell. [A] Number of cases in childhood, for males (M) and females (F). * $p < .05$.

Multivariate Associations

Table 3.3 shows the associations between CBCL scales and DSM-IV diagnoses using a forward stepwise logistic regression.

Age was an additional predictor in the prediction of disruptive disorders by the CBCL Externalizing scale: older males (ages 12-16 at time 1) were less likely to meet criteria for disruptive disorders at follow-up than younger males (ages 4-11 at time 1) (odds ratio, 0.5; 95% confidence interval, 0.3-1.0). The other associations listed in Table 3.3 were not influenced by age nor SES.

Discussion

Children with high levels of parent reported problems are more likely to meet criteria for DSM-IV diagnoses in adulthood than children who can be considered as normal. Although the child-adult continuities represent moderate effect sizes, with odds ratios for associations between CBCL syndrome scales and DSM-IV diagnoses ranging from 1.8 to 6.1, these findings are remarkable for a number of reasons, including: the long follow-up period spanning 14 years; the use of information from different informants (parents at time 1 versus subjects themselves at follow-up); the use of different assessment procedures (questionnaire at time 1 versus diagnostic interviews at follow-up); and the use of different diagnostic paradigms (empirically derived and dimensional CBCL scales versus DSM-IV diagnostic categories) across time.

Diversity of Pathways

The univariate analyses showed that a number of CBCL scales predicted DSM-IV disorders within the same domain of psychopathology. An example of homotypic continuity is the CBCL scale Anxious/Depressed, which predicted anxiety disorders (among females) and mood disorders (among males). Another example are the CBCL scales Delinquent Behavior and Aggressive Behavior covering the domain of conduct problems which predicted disruptive disorders in adulthood. In contrast, a number of CBCL scales predicted DSM-IV disorders representing very different domains of psychopathology. Examples of such heterotypic continuity are the CBCL scale Anxious/Depressed, which predicted disruptive disorders in males, or

Table 3.3

Adjusted associations between childhood emotional and behavioral problems and adult DSM-IV disorders

Childhood predictors, (CBCL)	Adult diagnosis at time 6 (1997)					
	Any DSM disorder		Anxiety disorders		Mood disorders	
	Males	Females	Males	Females	Males	Females
I						
Total Problem score	–	1.8 (1.2-2.6)	–	2.3 (1.5-3.4)	–	–
II						
Internalizing	–	–	–	–	5.2 (1.8-14.5)	–
Externalizing	–	2.0 (1.4-2.9)	–	2.4 (1.6-3.6)	–	–
III						
Withdrawn	–	–	–	–	–	–
Somatic Complaints	–	–	–	–	–	–
Anxious/Depressed	–	–	–	–	–	–
Social Problems	–	2.2 (1.2-3.8)	–	2.2 (1.2-4.0)	–	–
Thought Problems	–	–	–	–	–	–
Attention Problems	–	–	–	–	–	–
Delinquent Behavior	2.6 (1.5-4.7)	–	–	–	6.1 (2.0-18.6)	–
Aggressive Behavior	–	–	–	–	–	–

Table 3.3 continues

Table 3.3 (continued)

	Childhood predictors, (CBCL)	Adult diagnosis at time 6 (1997)			
		Substance abuse/dependence		Disruptive disorders	
		Males	Females	Males	Females
I					
	Total Problem score	–	–	2.2 (1.2-4.0)	4.6 (1.3-16.2)
II					
	Internalizing	–	–	–	–
	Externalizing	–	–	1.9 (1.0-3.6)[A]	10.4 (2.7-40.8)
III					
	Withdrawn	–	–	–	–
	Somatic Complaints	3.0 (1.1-8.3)	–	–	–
	Anxious/Depressed	–	–	2.5 (1.03-6.2)	–
	Social Problems	–	–	–	–
	Thought Problems	–	–	–	–
	Attention Problems	–	–	–	–
	Delinquent Behavior	–	–	3.2 (1.5-7.2)	–
	Aggressive Behavior	–	–	–	–

Note. All associations are given as multivariate adds ratios (95% confidence interval) adjusted for all variables included in the model. Three sets of regression analyses were performed: I containing dichotomized Total Problem scores; II containing dichotomized Internalizing and Externalizing scores; III containing all dichotomized CBCL syndrome scores. Socioeconomic status (low (1) versus high (0) and age-group (4-11 versus 12-16) were candidate predictor variables in all models. [A] Age was an additional predictor: older males (ages 12-16 at time 1) were less likely to meet criteria for disruptive disorders at follow-up than younger males (ages 4-11 at time 1) (odds ratio, 0.5; 95% confidence interval, 0.3-1.0).

the Delinquent Behavior scale which predicted anxiety disorders in females and mood disorders in males.

Looking backward, starting from the outcome diagnoses, to examine which earlier problems were at the roots of later psychiatric disorders, we found that DSM-IV diagnoses could be predicted by several CBCL scales. For example, disruptive disorders in males were predicted by the CBCL scales Anxious/Depressed, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior. Similarly, anxiety disorders in females were predicted by the CBCL scales Somatic Complaints, Anxious/Depressed, Social Problems, and Delinquent Behavior. Mood disorders in males were predicted by the CBCL scales Anxious/Depressed and Delinquent Behavior. Especially disruptive disorders in males and anxiety disorders in females were predicted by a diversity of problems. Reversely, in some cases multiple DSM-IV diagnoses were predicted by one CBCL scale. For example, both mood disorders and disruptive disorders were predicted by the CBCL scale Anxious/Depressed.

The multivariate logistic regression analyses allowed us to determine which combinations of associations between time 1 CBCL scales and later DSM-IV disorders remained significant after adjusting for any other association between CBCL scales and DSM-IV disorders. This reduced the complexity of findings. Only one CBCL scale, the Delinquent Behavior scale, remained as a predictor which was associated with more than one DSM-IV disorder at follow up: mood disorders and disruptive disorders. Reversely there was only one DSM-IV disorder which was predicted by more than one CBCL scale: disruptive disorders were predicted by the Delinquent Behavior and Anxious/Depressed scales. Only one association, between the Delinquent Behavior scale and DSM-IV disruptive disorders, remained that reflected homotypic continuity. This indicates the strong developmental link between childhood conduct problems and adult disruptive behaviors.

Sex Differences

Our findings indicate sex differences in the developmental pathways from child to adult psychopathology. The CBCL Total Problem score, as a general indicator of malfunctioning in childhood was associated with more diverse problems among females than among males: anxiety disorders and disruptive disorders among

females; disruptive disorders among males. Also the CBCL Total Problem score was significantly associated with any DSM-IV disorder in females but not in males. It thus seems that when high levels of general psychopathology are present in girls, it is more likely to be associated with later psychopathology than when this is the case in boys.

On the level of specific time 1 CBCL scales there were more associations between CBCL scales and DSM-IV disorders for males than for females. The only association that remained significant in the multivariate analysis for females was between the CBCL Social Problems scale and anxiety disorders, whereas the four associations that remained significant for males all involved some kind of externalizing behavior either as predictor or as outcome (including substance abuse/dependence). This suggests that females show more diverse and less focussed developmental pathways, whereas males show more specific child-adult links involving some kind of externalizing problem.

Although the present study demonstrated sex differences in the developmental pathways from child to adult psychopathology, the sample size in combination with the low prevalence of some disorders did not allow for testing of these sex differences by computing interactions in the prediction of DSM-IV diagnoses in the entire sample.

Attention Problems

Most outcome studies of children with Attention Deficit/Hyperactivity Disorder (ADHD) came to the conclusion that these children have a poor outcome (for review, see Taylor, 1999). These studies often involved clinically referred children who often have a multitude of problems besides ADHD. In some studies, but not all, did the authors adjust for confounding factors. Moreover, most studies that determined the outcome of childhood ADHD did not extend their follow-up beyond adolescence.

In our study the CBCL scale Attention Problems including items such as can't concentrate, can't sit still, impulsive, and clumsy, did not predict any of the DSM-IV categories, when adjusted for the associations with the other CBCL scales. The fact that in the univariate analyses the Attention Problems scale predicted later disruptive disorders in males, reflects the time 1 correlations between the Attention Problems

scale and other CBCL scales which were more strongly associated with disruptive disorders than was the Attention Problems scale.

This negative finding supports the findings by Fergusson et al. (1997), who reported that attention problems at age 8 in a birth cohort of New Zealand children were unrelated to juvenile offending or substance abuse at age 18 after adjustment for confounding factors such as early conduct problems.

The fact that in females the Attention Problems scale was not significantly associated with any of the DSM-IV disorders suggests that attentional difficulties should be regarded as an index for risk of later adulthood psychopathology in males but not in females.

Mood Disorders/Disruptive Disorders

Although the prevalence of mood disorders among males at follow up was much less than among females, mood disorders were associated with childhood problems only in males. This suggests that the developmental pathways towards the rarer mood disorders in adult males tends to be rooted in earlier problems during childhood, whereas the much more prevalent mood disorders in adult females tend to emerge de novo later in life.

The gender difference in prevalence of DSM-IV mood disorders in our sample of 18- to 30-year-olds at follow-up is consistent with that found in other studies, although the female:male ratio of 4:1 in our study exceeds the ratio for 12-month risk of DSM-III-R affective disorders of 1.7:1 found in the National Comorbidity survey in which 15- to 54-year-olds were assessed with the CIDI (Kessler et al., 1994).

This female preponderance of mood disorders is not present in prepubertal children. In a recent article, Cyranowski et al. (2000) provide a theoretical framework to explain this gender gap in depression which emerges somewhere in adolescence. They emphasize the depressogenic diathesis which makes females more than males prone to become depressed when faced with negative life events, especially life events with interpersonal consequences. Our findings are in agreement with this theoretical framework, if the earlier depressive phenomena that are the forerunners of DSM-IV mood disorders in our sample emerged in late adolescence/young adulthood. In addition to the possible role of adolescence/young

adulthood as the developmental period in which female depression emerges, our findings emphasize the role of childhood origins of depression in males.

Our findings fit very well the findings from an adolescent twin study indicating that the genetic contribution to depression is only present in females after pubertal onset, and is not present in prepubertal girls, as well as in prepubertal and postpubertal boys (Silberg et al., 1999).

Our findings also shed light on the complex association between antisocial behaviors and mood disorders both within and across time. Looking backward, mood disorders were predicted by the CBCL Anxious/Depressed and Delinquent Behavior scales in univariate analyses. However, after adjusting for the time 1 correlation between the Anxious/Depressed and the Delinquent Behavior scales, the only developmental pathway that remained was between mood disorders in adult males and high scores on the Delinquent Behavior scale at time 1. In other words, the association between the Anxious/Depressed scale and later mood disorders in males was the result of the time 1 correlation between the Anxious/Depressed and the Delinquent Behavior scales, which in turn was strongly associated with later mood disorders.

Looking forward from childhood anxiety and depression to adulthood, the CBCL Anxious/Depressed scale predicted later anxiety disorders in females and mood and disruptive disorders in males. However, after adjustment for time 1 correlations, the only significant predictive relationship that remained for the Anxious/Depressed scale was with later disruptive disorders in males.

Starting with adult disruptive disorders and looking backwards at childhood precursors, we found that both the Anxious/Depressed and the Delinquent Behavior scales were associated with later disruptive disorders in males. This means that when boys are scored in the deviant range of both the Anxious/Depressed and Delinquent Behavior scales, the odds ratio indicating the risk for later disruptive disorder is $2.5 \times 3.2 = 8.0$. This is consistent with findings from a follow-up of a clinical sample of depressed children (Harrington et al., 1991), indicating that depressives with conduct disorder had a worse outcome and a higher risk of adult criminality than depressed children without conduct problems.

Our findings suggest sex differences in the developmental pathways towards adult mood disorders as well as sex differences in the developmental pathways from

affective problems in childhood to psychiatric disorders in adulthood. Our findings do not agree with findings from other studies suggesting strong homotypic continuity between child and adult depression (Harrington, 1999). However, most of these studies pertain to clinical samples, and adjustment for confounding factors is seldomly applied. Instead, our results suggest the importance of distinguishing between childhood onset depression in males which, in association with conduct problems, predicts later mood disorders and disruptive disorders, versus depression in females which is not linked with childhood problem behaviors and which emerges de novo. Our results support the suggestion that we should not base assumptions concerning the mechanisms leading to depression in males on findings from females. Biological and environmental factors that play a role in the etiology of depression in females need not be the same as biological and environmental factors that play a role in the etiology of depression in males. The possibility that genetic factors may play a less prominent role in the etiology of depression in males than in females, in combination with our findings that depression in adult males but not in females is rooted in both affective and conduct problems in childhood opens up interesting perspectives for studying the role of environmental factors in the emergence of adulthood depression in males.

Limitations of the Study

The main limitation of the current study, shared with other longitudinal studies is the question concerning generalizability of findings due to sample attrition, despite the fact that we traced 79% of the time 1 sample and that our data did not suggest selective attrition. Another limitation is that we did not include standardized information on treatment during the follow-up period. Therefore, we do not know to what extent possible interventions have influenced the course of problem behaviors from childhood into adulthood. A third limitation is the sample size of 1,578 subjects from the general population, which is too small to examine developmental pathways toward specific diagnoses or relatively rare disorders such as schizophrenia or bipolar disorder, or to examine the further development of very rare childhood disorders such as autism. However, for the most prevalent conditions both in childhood as well as in adulthood we were able to examine the developmental links.

Conclusions and Clinical Implications

The main finding that children who have high levels of parent reported problems are at increased risk of fulfilling criteria for DSM-IV disorders in adulthood is important, because there still is little empirical evidence for childhood antecedents of adult psychiatric disorder in unselected samples. However, the strongest impression with which the results of our study left us behind was the multitude, and the sometimes unexpected directions, of the pathways from childhood problems toward disorders in adulthood. Our results corroborated the observations of one of the earliest clinical theorists in the field of developmental psychopathology, Anna Freud (1966), who stated that in spite of all the links between infantile and adult neuroses, there is no certainty that a particular type of infantile neurosis will prove to be the forerunner of the same type of adult neurosis.

Our study has a number of implications. First, our study identified a number of childhood problems that have a tendency to continue into adulthood, or that seem to predict other problems in adulthood. We found a relatively strong link between oppositional behaviors in childhood and later disruptive disorders in both females and males. In males this child-adult continuity of disruptive behaviors is even augmented when there is comorbidity with affective problems in childhood.

It is especially important to recognize oppositional behaviors in young children, because they are especially prone to affect later adult functioning in a negative way. Our results support the importance of early intervention and prevention of oppositional behaviors in young children.

Second, the finding that the Attention Problems syndrome scale did not predict any form of adult psychopathology was important because it supports findings reported in other studies of unselected samples, and suggests that later psychopathology (in males in our study) is not so much the direct effect of the attentional difficulties but the effect of psychopathology associated with attentional problems such as oppositional behaviors. Our findings suggest that, in terms of long term outcome, it is more important to focus on associated psychopathology than on attentional problems per se.

Third, our results suggest the importance of distinguishing between depression in adult males which seems to have its roots in childhood problems, versus depression

in females which is not linked with childhood problem behaviors and which seems to emerge de novo at a later stage in life.

4 14-Year Prediction of Poor Outcome and Impaired Social Functioning

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Chapter 4

14-Year Prediction of Poor Outcome and Impaired Social Functioning

Abstract

Background: *In addition to information about the continuity and discontinuity of psychopathology, it is also important to determine the broader consequences of child psychopathology for adult functioning.* ***Aims:*** *To predict poor outcome and impaired social functioning by parent reported childhood problems in 1,615 adults originally aged 4 to 16 years from the general population, across a 14-year period.* ***Methods:*** *Parents' Child Behavior Checklist (CBCL) ratings were used to predict poor outcome events and signs of impaired social functioning in adulthood.* ***Results:*** *Numerous significant associations between CBCL scales and indicators of poor outcome and impaired social functioning were found.* ***Conclusions:*** *Childhood psychopathology creates a risk for maladjustment in adulthood, partly independent of psychopathology.*

Introduction

In addition to information about the continuity and discontinuity of psychopathology across a wide age range (Hofstra et al., 2000), it is also important to determine the broader consequences of child psychopathology for adult functioning, including referral to mental health services, arrest by the police, expulsion from school or job, alcohol abuse, and suicidal behavior, as well as impaired social functioning (for brevity we use child to include adolescent). These signs of maladjustment and social dysfunctioning are intrinsically important in evaluating people's functioning in adulthood. Not only has it been found that social dysfunctioning in adults tends to have a less favorable and more protracted course than psychopathology (Paykel and Weissman, 1973; Waryszak, 1982; De Jong et al., 1986), social dysfunctioning also seems to react to other types of interventions than those designed for the treatment of psychopathology (Bothwell and Weissman, 1977; Platt et al., 1981).

Because certain signs of maladjustment may be manifested by people with psychopathology, whereas other signs may lack one-to-one associations with psychopathology, it is important to identify predictors of signs of maladjustment whether or not those who manifest them would also be considered deviant.

Previous Research

To identify adolescent predictors of young adult signs of maladjustment, Achenbach et al. (1998) tested predictors of school drop-out, unwed pregnancy, substance use, mental health services, suicidal behavior, police contacts, and being fired from jobs in young adulthood across informants (parents and adolescents themselves). Subjects (n = 743) from a general population sample were 13 through 16 years old at initial assessment, and 19 through 22 years at 6-year follow-up. It was found that the Delinquent Behavior syndrome predicted the most poor outcomes. At initial assessment, however, subjects were adolescents, not making it possible to assess the link between childhood and young adulthood functioning.

At an earlier stage of the current study, Ferdinand and Verhulst (1995a) tested parents' Child Behavior Checklist (CBCL; Achenbach, 1991a; Verhulst et al., 1996) ratings and demographic variables in adolescence (ages 13 through 16 years) as candidate predictors of signs of maladjustment such as receiving mental health services, trouble with the police, suicide attempts, and alcohol abuse in young adulthood (ages 21 through 24 years) (n = 459) across an 8-year time span. It was found that referral to mental health services was predicted by deviant scores on the Anxious/Depressed scale, while suicide attempts were predicted by deviance on the Withdrawn scale. Again subjects were beyond childhood at the first assessment.

Aims

The present longitudinal study was designed to test the 14-year developmental course of psychopathology in a representative sample of children and adolescents initially aged 4 through 16 years, who were 18 through 30 years at follow-up. The main aim of the present study was to determine the power of different syndromes and demographic variables to predict poor outcome events and indices of impaired social functioning across a 14-year follow-up interval.

Methods

Sample

The present study was part of an ongoing longitudinal general population study, which started in 1983 in the Dutch province of Zuid-Holland. For details on the initial data collection, see Verhulst et al. (1985a; 1985b), and on the procedures of the present study, see Hofstra et al. (2000).

We focussed here on the 1,615 subjects (751 males and 864 females) who provided outcome information at follow-up (1997), and who comprised 80.9% of the 2,076 subjects at initial assessment in 1983. Response rate was corrected for deceased subjects, mentally retarded individuals, and subjects who had emigrated.

"Dropouts" (i.e., all subjects for whom no outcome information was obtained) had 1983 CBCL Total Problem scores similar to those of the "remainers" (mean = 21.4 for 461 dropouts and 20.5 for 1,615 remainers). The mean socioeconomic status, assessed with a six-point scale of parental occupation (Van Westerlaak et al., 1975), for dropouts was slightly, though significantly, lower than that for remainers (3.4 for dropouts and 3.6 for remainers; $p = .01$), and more females than males responded (81.5% versus 73.9%; $p < .001$).

Instruments

Psychopathology in Childhood and Adolescence

The Child Behavior Checklist (CBCL/4-18; Achenbach, 1991a) was used to obtain standardized parent reports of children's problem behaviors, at initial assessment. The CBCL contains 120 problem items. Each item is scored 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true, based on the preceding 6 months. The Total Problem score is the sum of all items except items 2 (Allergy) and 4 (Asthma). Internalizing is the sum of scores on items in the Withdrawn, Somatic Complaints, and Anxious/Depressed scales, and Externalizing is the sum of scores on the Delinquent Behavior and Aggressive Behavior scales (Achenbach, 1991a). The other syndrome scales of the CBCL are Social Problems, Thought Problems, and Attention Problems. Good reliability and validity of the CBCL have been replicated for the Dutch translation (Verhulst et al., 1996).

Signs of Maladjustment in Adulthood

Poor Outcome Events

The following poor outcome variables, were used: (a) referral to mental health services; (b) physical self-harmed or suicide attempts; (c) arrest by the police; (d) expulsion from school or job, all in the 12 months prior to the interview, and (e) more often drunk than others in the 6 months prior to the interview; (f) no formal education beyond elementary school. The number of times subjects had been drunk in the preceding 6 months was determined using the Young Adult Self-Report (Achenbach, 1997) (item number 118). A subject was judged as being more often drunk than others if he or she scored above the 90th percentile of the cumulative frequency distribution for the frequency of being drunk, as computed for males and females separately. We defined general poor outcome as the presence of at least one poor outcome event.

Impaired Social Functioning

Social functioning was assessed using the Groningen Questionnaire about Social Behavior (GQSB; De Jong and Van der Lubbe, 1994; Van der Lubbe, 1995). The GQSB contains 11 subscales covering different areas of functioning: spare time activities; self-care (i.e., bodily care and hygiene, management of personal possessions, including direct living surroundings); civic sense (i.e., role as citizen, interest and participation in society); daily activities (i.e., educational activities, employment, and housekeeping); parental functioning; family functioning (for subjects who do not live alone); family functioning, living alone (for subjects who live alone); intimate relationship with parents; intimate relationship with siblings; intimate relationship with partner; and social activities (limited to activities with friends). Subjects were asked to indicate whether items were applicable to their situation within the past four weeks. Each item has four response options, ranging from never to always. By summing the scores, a total score for each subscale was derived. Not all scales apply to all subjects. For instance, parental functioning does not apply to subjects who do not have children. Good reliability and validity of the GQSB have been reported for ages 18 through 65 years (Van der Lubbe, 1995).

Twenty-six subjects could not answer questions regarding social activities (limited to activities with friends) because they indicated not to have any close

friends. The lack of close friends was added as a separate sign of impaired social functioning.

Statistical Analyses

Large prevalence differences of outcome variables for males versus females were present in the current study. Therefore analyses were performed for males and females separately. CBCL scale scores were dichotomized. For the syndrome scales a cutoff point corresponding to the 95th percentile was used. For the Internalizing, Externalizing and Total Problem scale the 82nd percentile was used as the cutoff. Cutoffs were based on Dutch normative data (Verhulst et al., 1996). Poor outcome events were scored as 0 when the event was not present, and as 1 when present. The GQSB scale scores were dichotomized as recommended by De Jong and Van der Lubbe (1994). Subjects scoring above the cutoff were considered to be impaired in their social functioning on that specific subscale and subjects scoring below the cutoff were regarded as functioning normally.

Univariate Analyses. Contingency tables were used to determine the univariate associations between subjects initially (1983) scoring in the deviant versus normal range, and poor outcome events and signs of impaired social functioning at follow-up.

Logistic Regression Analyses. Because the CBCL Total Problem score was based on items also present in the Internalizing and Externalizing scales, and because the Internalizing and Externalizing scales contained items that were also present in the syndromes, we performed logistic regression analyses separately for three sets of independent variables, using only those predictors that were significant in the univariate analyses: (a) the syndrome scales; (b) the Internalizing and Externalizing scales; and (c) the Total Problem score. A forward stepwise procedure was used, with initial age (two groups: 4-11 years (scored 0) versus 12-16 years (scored 1)), and parental SES (high (scored 0) versus low (scored 1)) as candidate predictor variables. All statistical tests were performed with SPSS 8.0 for Windows.

Table 4.1

Prevalence of signs of maladjustment in adulthood

Signs of maladjustment	*n* (total)	*n* (M-F)	Impaired males	Impaired females	*p*-value[a]
Referral	1615	751-864	23 (3.1%)	78 (9.0%)	<.001
Suicide attempt	1615	751-864	2 (0.3%)	11 (1.3%)	.026
Arrested	1615	751-864	6 (0.8%)	3 (0.3%)	.318
Expulsion from school/job	1615	751-864	12 (1.6%)	4 (0.5%)	.024
Alcohol abuse	1615	751-864	75 (10.0%)	99 (11.5%)	.341
Only elementary school	1615	751-864	27 (3.6%)	24 (2.8%)	.349
General poor outcome[b]	1615	751-864	128 (17.0%)	189 (21.9%)	.015
GQSB[c]					
-spare time activities	1615	751-864	96 (12.8%)	134 (15.5%)	.118
-self care	1615	751-864	63 (8.4%)	19 (2.2%)	<.001
-civic sense	1615	751-864	230 (30.6%)	286 (33.1%)	.287
-daily activities	1615	751-864	182 (24.2%)	186 (21.5%)	.196
-parental functioning	236	83-153	7 (8.4%)	12 (7.8%)	.873
-family functioning	1361	622-739	174 (28.0%)	96 (13.0%)	<.001
-family functioning, living alone	254	129-125	43 (33.3%)	21 (16.8%)	.002
-intimate relationship with parents	1600	744-856	106 (14.2%)	105 (12.3%)	.243
-intimate relationship with siblings	1494	686-808	170 (24.8%)	166 (20.5%)	.051
-intimate relationship with partner	1137	465-672	58 (12.5%)	89 (13.2%)	.703
-social activities	1589	740-849	129 (17.4%)	149 (17.6%)	.951
No close friends	1615	751-864	11 (1.5%)	15 (1.7%)	.666

Note. Numbers indicate numbers of subjects; numbers in parentheses indicate percentages. [a] χ^2-tests; when cell sizes were < 5, Fisher's exact test; *p*-value is level of significance. [b] General poor outcome: at least one outcome event is present. [c] GQSB, Groningen Questionnaire about Social Behavior.

Results

Prevalence of Signs of Maladjustment in Adulthood

Table 4.1 shows the prevalences for each of the signs of maladjustment as assessed in adulthood (1997). Referral to mental health services, suicide attempts and other self-harm, and a general poor outcome were significantly more prevalent among females versus males. Expulsion from school or job, being impaired on the self-care scale of the GQSB, and being impaired in family functioning, both for

Table 4.2

Associations between deviant time 1 (1983) CBCL scores and poor outcome in adulthood (time 6, 1997)

Predictors time 1, CBCL	Poor outcome in adulthood						
	Referral to mental health services		Suicide attempt[M]	Arrested by the police[F]	Expulsion school/job[F]	Alcohol abuse	
	Males	Females	Females	Males	Males	Males	Females
[I]Total Problem score	–	1.9 (1.1-3.2) *2.0 (1.2-2.8)*[Aa]	–	–	–	–	–
[II]Internalizing	–	–	–	–	–	–	–
Externalizing	–	–	3.6 (1.1-12.0)	–	–	–	2.5 (1.6-4.0) *2.7 (1.7-4.3)*[SA]
[III]Withdrawn	–	–	–	–	6.1 (1.6-23.6)	–	–
Anxious/Depressed	–	2.3 (1.1-4.9)	–	–	–	–	–
Social Problems	5.7 (2.0-16.2) *4.8 (1.6-14.0)*[Sa]	2.3 (1.1-4.7) *2.3 (1.1-4.7)*[Aa]	–	–	–	–	–
Attention Problems	2.9 (1.1-8.2)	–	–	–	–	–	–
Delinquent Behavior	–	–	–	5.6 (1.0-31.2)	–	2.3 (1.2-4.6) *2.0 (1.0-4.0)*[Ab]	–
Aggressive Behavior	–	–	–	–	–	–	2.0 (1.1-3.9) *2.1 (1.1-4.1)*[SA]

Table 4.2 continues

Table 4.2 (continued)

Predictors time 1, CBCL	Poor outcome in adulthood			
	Only elementary school		General poor outcome	
	Males	Females	Males	Females
[I]Total Problem score	4.1 (1.9-8.9)	–	1.8 (1.2-2.8)	1.7 (1.2-2.6)
			1.7 (1.1-2.7)[Ac]	*1.8 (1.2-2.7)*[Sb]
[II]Internalizing	–	–	1.7 (1.1-2.6)	–
Externalizing	3.7 (1.7-8.1)	3.8 (1.7-8.6)	2.0 (1.3-3.0)	2.4 (1.6-3.4)
			2.0 (1.3-3.0)[Ac]	*2.5 (1.7-3.6)*[Sb]
[III]Withdrawn	–	–	2.1 (1.1-4.3)	–
Anxious/Depressed	–	–	–	–
Social Problems	6.0 (2.3-15.8)	–	2.3 (1.1-4.6)	–
	3.6 (1.2-10.9)			
Attention Problems	–	–	–	–
Delinquent Behavior	3.3 (1.3-8.6)	–	2.7 (1.5-4.8)	–
			2.5 (1.4-4.3)[Ac]	
Aggressive Behavior	4.5 (1.9-10.7)	4.3 (1.7-11.3)	2.1 (1.2-3.7)	2.5 (1.5-4.3)
	3.0 (1.1-8.0)			*2.7 (1.6-4.5)*[Sb]

Note. Table entries are univariate odds ratios (95% confidence interval) between each CBCL score in the deviant range and poor outcome at follow-up, derived from contingency tables. The CBCL Somatic Complaints and Thought Problems scales did not predict poor outcome events and are not included in the table. Figures printed in *italic* are multivariate odds ratios (95% confidence interval) derived from logistic regression analyses. In the logistic regression analyses we included only significant univariate odds ratios. Three sets of regression analyses were performed: I containing dichotomized Total Problem scale scores; II containing dichotomized Internalizing and Externalizing scal scores; III containing dichotomized Child Behavior Checklist (CBCL) syndrome scores. Socioeconomic status (low (1) versus high (0)) and age group (4-11 versus 12-16) were candidate predictor variables in all models. [M] No significant odds ratio was found for males. [F] No significant odds ratio was found for females. [S] SES was an additional predictor; [Sa] OR = 6.0 (1.8-20.4), [Sb] OR = 0.7 (0.5-0.9). [A] Age was an additional predictor; [Aa] OR = 1.7 (1.0-2.8), [Ab] OR = 0.3 (0.2-0.6); [Ac] OR = 0.5 (0.3-0.8), [SA] Both SES (OR = 0.5 (0.3-0.7)) and age (OR = 0.6 (0.4-0.9) were additional predictors.

subjects living alone and subjects not living alone, were significantly more prevalent among males versus females.

Prediction of Poor Outcome Events

Table 4.2 gives the odds ratios and 95% confidence intervals for the associations between the CBCL scales and the poor outcome variables. Both the univariate and the multivariate (in italics) odds ratios are presented. Most poor outcome events were associated with CBCL scales, except for suicide attempts and other self-harm in males, and being arrested by the police and expulsion from school or job in females. Of the CBCL scales, the Somatic Complaints and Thought Problems scales did not predict poor outcome variables.

The univariate analyses, showed that poor outcome variables were predicted by one or two CBCL syndrome scales, except for no formal education beyond elementary school and general poor outcome in males, which were predicted by a wide range of CBCL syndrome scales. Furthermore, when looking at the multivariate analyses, the Social Problems and Aggressive Behavior scales were the most frequent predictors of poor outcome variables.

Age and SES Effects. Age and SES were candidate predictors in the logistic regression analyses. Males with a lower parental SES in childhood were more likely to seek mental health service in adulthood. Furthermore, females with a higher parental SES in childhood had a higher probability of alcohol abuse and general poor outcome in adulthood. Older females were more likely to seek mental health service in adulthood, and both younger females and males had a higher probability of later alcohol abuse. Younger males had a higher probability of general poor outcome.

Prediction of Impaired Social Functioning

Table 4.3 gives the odds ratios and 95% confidence intervals for the associations between the CBCL and the GQSB scales. Both the univariate and the multivariate (in italics) odds ratios are presented. The 11 subscales of the GQSB were in general predicted by scores in the deviant range on a wide range of CBCL scales. The CBCL Total Problem score predicted all GQSB subscales, except for the self-care and social activities scales. Apart from the scales self care, daily activities, family

Table 4.3

Associations between deviant time 1 (1983) CBCL scores and impaired social functioning in adulthood

Predictors time 1, CBCL	Impaired social functioning in adulthood							
	GQSB-spare time activities		GQSB-self care[F]	GQSB-civic sense		GQSB-daily functioning[F]	GQSB-parental functioning	
	Males	Females	Males	Males	Females	Males	Males	Females
[I]Total Problem score	1.7 (1.0-2.7)	1.7 (1.1-2.7)	–	1.8 (1.2-2.5)	1.7 (1.2-2.4)	–	5.9 (1.2-29.4)	3.5 (1.0-11.9)
					1.6 (1.1-2.3)[Aa]			
[II]Internalizing	2.2 (1.4-3.6)	1.6 (1.1-2.6)	–	2.0 (1.4-2.9)	–	1.7 (1.1-2.5)	–	–
Externalizing	–	2.3 (1.5-3.4)	–	–	2.0 (1.4-2.8)	–	–	–
		2.3 (1.5-3.4)			*1.9 (1.4-2.7)*[Aa]			
[III]Withdrawn	–	–	–	2.8 (1.5-5.3)	1.8 (1.0-3.2)	2.9 (1.5-5.5)	14.8 (1.7-128.2)	–
						2.9 (1.5-5.5)	*14.8 (1.7-128.2)*	
Anxious/Depressed	2.4 (1.2-4.8)	2.4 (1.3-4.6)	–	–	–	–	9.7 (1.3-72.3)	–
Social Problems	–	–	–	2.0 (1.1-3.9)	–	–	–	–
Thought Problems	–	–	–	4.7 (1.8-12.8)	–	3.2 (1.3-8.3)	–	13.9 (1.8-109.3)
				4.3 (1.6-11.7)				
Attention Problems	–	2.4 (1.3-4.4)	–	–	2.0 (1.1-3.6)	–	–	–
Delinquent Behavior	2.6 (1.4-4.8)	–	–	1.9 (1.1-3.2)	–	–	–	–
	2.6 (1.4-4.8)			*1.8 (1.0-3.0)*				
Aggressive Behavior	–	2.4 (1.4-4.2)	2.3 (1.1-4.6)	1.9 (1.2-3.2)	2.3 (1.4-3.8)	–	5.6 (1.1-29.1)	–
		2.4 (1.4-4.2)			*2.2 (1.3-3.6)*[Aa]			

Table 4.3 continues

Table 4.3 continued

Predictors time 1, CBCL	Impaired social functioning in adulthood						
	GQSB-family functioning		GQSB-family[L,A,M]	GQSB-intimate rel. with parents		GQSB-intimate rel. with siblings	
	Males	Females	Females	Males	Females	Males	Females
[I]Total Problem score	2.5 (1.7-3.7)	2.1 (1.3-3.4)	–	1.9 (1.2-3.0)	–	2.9 (2.0-4.3)	1.7 (1.1-2.6)
	2.4 (1.6-3.6)[Ab]	*1.9 (1.2-3.2)*[Ac]		*2.0 (1.3-3.2)*[Ad]			
[II]Internalizing	1.9 (1.2-2.9)	1.7 (1.0-2.9)	–	3.1 (2.0-4.8)	–	2.4 (1.6-3.6)	–
				3.3 (2.1-5.3)[Ad]		*2.4 (1.6-3.6)*	
Externalizing	2.1 (1.4-3.1)	1.9 (1.2-3.1)	–	–	1.9 (1.2-3.0)	1.9 (1.3-2.8)	2.3 (1.5-3.4)
	2.1 (1.4-3.2)[Ab]	*1.8 (1.1-3.0)*[Ac]					
[III]Withdrawn	–	3.2 (1.6-6.4)	–	2.3 (1.1-4.8)	–	2.5 (1.3-4.8)	–
		3.3 (1.6-6.6)[Ac]					
Anxious/Depressed	–	–	–	3.7 (2.0-7.1)	2.7 (1.4-5.3)	2.4 (1.3-4.6)	–
				2.4 (1.2-5.2)	*2.7 (1.4-5.3)*		
Social Problems	–	2.3 (1.1-4.7)	–	4.2 (2.1-8.3)	2.0 (1.0-4.0)	2.8 (1.4-5.4)	–
				2.8 (1.3-6.1)			
Thought Problems	–	4.0 (1.1-13.8)	–	–	–	2.8 (1.1-7.3)	–
Attention Problems	–	2.6 (1.3-5.3)	–	2.2 (1.2-4.0)	2.2 (1.1-4.3)	2.4 (1.4-4.2)	–
						2.4 (1.4-4.2)	
Delinquent Behavior	3.9 (2.2-6.8)	–	7.9 (1.6-38.6)	2.1 (1.1-3.9)	–	–	–
	3.5 (1.9-6.3)[Ab]						
Aggressive Behavior	2.0 (1.2-3.2)	2.0 (1.1-3.9)	–	2.2 (1.2-3.9)	–	–	1.8 (1.0-3.3)

Table 4.3 continues

Table 4.3 (continued)

Predictors time, CBCL	Impaired social functioning				
	GQSB-intimate relationship with partner		GQSB-social activities		No close friends[M]
	Males	Females	Males	Females	Females
[I]Total Problem score	2.0 (1.1-3.6)	2.5 (1.5-4.1)	–	–	–
[II]Internalizing	–	2.7 (1.6-4.4)	–	–	–
		2.0 (1.2-3.5)			
Externalizing	–	2.6 (1.6-4.3)	–	–	–
		2.1 (1.2-3.5)			
[III]Withdrawn	2.8 (1.1-7.0)	2.7 (1.3-5.6)	3.1 (1.6-6.0)	–	5.8 (1.8-18.9)
	2.8 (1.1-7.0)		*3.1 (1.6-6.0)*		*5.8 (1.8-18.9)*
Anxious/Depressed	–	3.6 (1.8-7.1)	2.0 (1.0-4.0)	–	4.2 (1.1-15.3)
		3.6 (1.8-7.1)			
Social Problems	–	2.6 (1.3-5.4)	2.7 (1.4-5.5)	2.0 (1.1-3.8)	–
				2.1 (1.1-3.9)[Ac]	
Thought Problems	4.4 (1.0-18.9)	–	–	–	–
Attention Problems	–	–	–	–	–
Delinquent Behavior	–	–	–	–	4.6 (1.2-16.8)
Aggressive Behavior	–	–	–	–	–

Note. Table entries are univariate odds ratios (95% confidence interval) between each CBCL score in the deviant range and impaired social functioning at follow-up, derived from contingency tables. The CBCL Somatic Complaints did not predict impaired social functioning and is not included in the table. Figures printed in *italic* are multivariate odds ratios (95% confidence interval) derived from logistic regression analyses. In the logistic regression analyses we included only significant univariate odds ratios. Three sets of regression analyses were performed: I containing dichotomized Total Problem scale scores; II containing dichotomized Internalizing and Externalizing scal scores; III containing dichotomized Child Behavior Checklist (CBCL) syndrome scores. Socioeconomic status (low (1) versus high (0)) and age group (4-11 versus 12-16) were candidate predictor variables in all models. [M] No significant odds ratio was found for males. [F] No significant odds ratio was found for females. [LA] GQSB-family functioning, people living alone. [A] Age was an additional predictor; [Aa] OR = 0.7 (0.5-0.9), [Ab] OR = 0.4 (0.2-0.6), [Ac] OR = 0.4 (0.2-0.7), [Ad] OR = 1.7 (1.0-2.7), [Ae] OR = 1.8 (1.2-2.5).

functioning for people living alone, and social activities, the GQSB scales were predicted by at least three CBCL syndrome scales in the univariate analyses. The Withdrawn scale was the most frequent predictor of impaired social functioning, in the multivariate analyses.

Age and SES Effects. Parental SES was not found to be an additional predictor of later social impaired functioning. Younger males (ages 4-11) had a higher probability of being impaired on the family functioning scale and younger females on the civic sense and family functioning scales at follow-up. Older males (ages 12-16) had a higher probability of being impaired on the intimate relationship with parents scale, and older females on the social activities scale.

No Close Friends. Having no close friends was not predicted by childhood problems in males, and was predicted by the CBCL Withdrawn and Anxious/Depressed scales in females, with the Withdrawn scale as the remaining predictor in the multivariate analysis.

Discussion

This study showed that children with high levels of parent reported problems are at risk for a number of poor outcome events, and for social impairment in adulthood, indicating that childhood problem behaviors have a considerable impact on individuals' functioning across a long time-span. These findings are remarkable, not only given the long follow-up period spanning 14 years but also because of the use of information from parents at the first assessment, and subjects themselves at follow-up.

Poor Outcome Events

Almost all events assessed in adulthood were predicted by behavioral and emotional problems in childhood. Significant odds ratios for associations between CBCL syndrome scales and referral, suicide attempts and other self-harm, arrest, expulsion from school or job, no formal education beyond elementary school, and alcohol abuse in adulthood were found, ranging from 1.7 to 6.1. General poor outcome was predicted by externalizing problems, in both males and females. The finding that the Delinquent Behavior scale in males and the Aggressive Behavior scale in females were associated with general poor outcome in adulthood extends

findings from prior studies in which strong continuity was found for externalizing behaviors from childhood into adulthood (e.g., Caspi and Moffitt, 1995; Huesmann et al., 1984; Loeber, 1982). These studies, however, pertained mainly to boys, whereas the present study showed that girls with aggressive behavior are at risk for maladaptive behaviors in adult life.

Referral. Children who fail to adapt to the peer milieu may be at risk for maladaptive outcomes (Parker et al., 1995). Evidence for this assumption was found in our previous study (Hofstra et al., 2000), showing that the CBCL Social Problems scale, reflecting problems in the relationship with other children, was an important predictor of adult psychopathology. The importance of the Social Problems scale as a predictor of maladaptive outcomes was emphasized by findings from the current study indicating that problematic peer relations were predictive of referral to mental health services for males and females in adulthood.

Suicide Attempts and Other Self-Harm. Shaffer (1974) has suggested two types of adolescents who are more likely to commit suicide. One could be characterized by aggressive and violent outbursts and the other by depression and withdrawal. Our results showed that, in females, externalizing problems in childhood were predictive of suicide attempts and other self-harm, in adulthood, thus supporting the link between aggression and suicide as suggested by Shaffer (1974).

We did not find an association between childhood internalizing problems and later suicide attempts and other self-harm, in contrast to prospective studies showing that depression in childhood was a predictor of later suicidal behaviors (e.g., Harrington et al., 1994). Harrington et al. (1994), however, used a clinical sample with subjects who have a higher probability to be especially problematic being overrepresented due to referral and selection bias. Although the authors adjusted for early conduct problems, it is possible that confounding factors other than conduct problems may have affected the outcome.

Arrest. Although the one-year prevalence of arrest was only 0.8% for males (6 cases), the strong association with the parent reported Delinquent Behavior scale, consisting of items such as breaks rules, steals, and has trouble with the law, shows that a severe consequence of antisocial behavior (arrest) is nearly always preceded by parent reported antisocial behaviors 14 years earlier. These findings also show that the majority of the 63 males with scores on the Delinquent Behavior scale in the

deviant range did not come into contact with the police 14 years later. This casts doubt on the feasibility of using single assessment and single informant screening procedures to select children who are at risk for later delinquency for prevention or early intervention.

Education. The finding that, for both sexes, lack of formal education beyond elementary school was predicted by scores in the deviant range on the Aggressive Behavior scale, extends findings from studies addressing the link between externalizing problems and academic underachievement, both within childhood and adolescence and across childhood into adolescence (for review, see Hinshaw, 1992). It has been pointed out that academic achievements open the doors to career advancement, which in turn is associated with a range of social advantages in adult life (Rutter, 1989). The present study showed that both boys and girls with high levels of aggression have fewer academic resources and may lack opportunities to be successful in later life.

In addition, for males we found that the Social Problems scale was associated with lack of formal education beyond elementary school as well, indicating an increased risk for academic failure when social problems and aggressive behavior occur simultaneously.

Alcohol Abuse. In females, alcohol abuse was predicted by scores in the deviant range on the Aggressive Behavior scale, whereas in males, alcohol abuse was predicted by scores in the deviant range on the Delinquent Behavior scale. These findings are in concord with findings from studies showing a longitudinal link between childhood antisocial behavior/aggression and later alcoholism (for review, see Zucker et al., 1995).

Attention Problems. Most outcome studies of children with Attention Deficit/Hyperactivity Disorder (ADHD) came to the conclusion that these children have a poor outcome (for review, see Taylor, 1999). These studies often involved clinically referred children who often have a multitude of problems besides ADHD. In some studies, but not all, did the authors adjust for confounding factors. Moreover, most studies that determined the outcome of childhood ADHD did not extend their follow-up beyond adolescence. In our study, the Attention Problems scale, predicted referral to mental health services in adult males (in the univariate and not in the multivariate analyses), but no other signs of poor outcome. This

finding is supported by Fergusson et al. (1997) who reported that attention problems at age 8, were unrelated to juvenile offending or substance abuse at age 18 after adjustment for confounding factors such as early conduct problems. However, attention problems were related to later poor academic success even after adjustment for confounding factors. This finding was not confirmed in the present study, most likely because we assessed academic success in a more stringent way.

Sex Differences

Our findings suggested sex differences in the diverse associations between behavioral and emotional problems in childhood and poor outcome variables in adulthood. For instance, the Delinquent Behavior scale predicted arrest in males but not in females, and the Externalizing scale predicted suicide attempt and other self-harm in females but not in males. Although the present study demonstrated sex differences in the adult consequences of childhood psychopathology, the sample size did not allow for testing of these sex differences by computing interactions in the prediction of the outcome variable in the entire sample.

Impaired Social Functioning

A one-to-one association between impaired social functioning and psychopathology was lacking in the present study. Of all individuals who were impaired on one or more GQSB scales, 25% scored in the deviant range on the Young Adult Self-Report (YASR; Achenbach, 1997). Thus, a substantial group of individuals with impaired social functioning could not be regarded as showing psychopathology. This finding emphasizes the importance of impaired social functioning as outcome measure in addition to the assessment of psychopathology. Social dysfunctioning has been found to be a predictor of relapse in depression (Tanner et al., 1975) and chronic schizophrenia (Curson et al., 1985), and to increase the risk of developing a secondary depression among patients with anxiety (Hecht et al., 1989) and patients with schizophrenia (Serban, 1979). Our findings showed that having experienced problems during childhood creates a risk for social impairment in adulthood, partly independent of psychopathology, which in turn may render the individual susceptible to later problems.

The Withdrawn scale, containing items such as would rather be alone, refuses to talk, timid, underactive, unhappy, and withdrawn was the most frequent predictor of signs of impaired social functioning, independent of other CBCL scales. Many of these items correspond to DSM-IV (American Psychiatric Association, 1994) criteria for depressive disorder (e.g., underactive, unhappy, and withdrawn). The impact of withdrawn-depressive symptoms on social functioning is also described for adult patient samples. In a 5-year follow-up of patients with an affective disorder, Coryell et al. (1993) found that social impairment persisted for years, even when individuals did no longer have clinical symptoms. Withdrawal from social interactions may preclude children from the interactive give-and-take necessary for the development of a 'normal' approach to interpersonal problem solving (Stewart and Rubin, 1995). Moreover, it may preclude children from taking advantage of the benefits of peer interchange (Rubin and Stewart, 1996). Our findings underline the impact of withdrawal during childhood on social functioning in adulthood.

Conclusions and Clinical Implications

The present study presents evidence for the association between behavioral and emotional problems in childhood and poor outcome variables and social impairment in adulthood, across a 14-year follow-up. Externalizing behaviors (i.e., delinquent behavior in males and aggressive behavior in females) were predictors of general poor outcome, stressing the strong continuity of externalizing problems. The finding that aggressive behavior was a predictor in females, extends earlier studies focussing on the continuity of aggressive behavior, which often included only males. Parent reported withdrawal appeared to be an especially important predictor of social impairment in adulthood. Although no direct equivalent DSM-IV (American Psychiatric Association, 1994) Axis I category exists, the present study underscores that withdrawal from social interaction and poor peer relations are important foci for intervention.

Clinical Implications

- Childhood psychopathology creates a risk for social impairment in adulthood, partly independent of psychopathology, which may render the individual susceptible to later problems;

- Externalizing behaviors were predictors of general poor outcome, stressing the strong continuity of externalizing problems;
- Attention problems in childhood did not predict adult maladjustment when adjusted for the associations with other childhood psychopathology.

Limitations

- The main limitation of the current study, shared with other longitudinal studies is the question concerning generalizability of findings due to sample attrition, despite the fact that we traced 80.9% of the time 1 sample and that our data did not suggest selective attrition;
- Because we did not include standardized information on treatment during the follow-up period we do not know to what extent possible interventions have influenced the course of problem behaviors from childhood into adulthood;
- The design of the present study did not enable us to take the influences of etiological factors into account.

5 Adolescents' Self-Reported Problems as Predictors of Psychopathology in Adulthood: A 10-Year Follow-Up Study

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Chapter 5

Adolescents' Self-Reported Problems as Predictors of Psychopathology in Adulthood: A 10-Year Follow-Up Study

Abstract

Background: *Knowledge of the course of psychopathology from adolescence into adulthood is needed to answer questions concerning origins and prognosis of psychopathology across a wide age range.* ***Aims:*** *To investigate the 10-year course and predictive value of self-reported problems in adolescence in relation to psychopathology in adulthood.* ***Methods:*** *Subjects from the general population, aged 11- to 19-years, were assessed with the Youth Self-Report (YSR) at initial assessment, and with the Young Adult Self-Report (YASR) 10 years later. A diagnostic interview, the Composite Diagnostic Interview Schedule (CIDI) and three sections of the Diagnostic Interview Schedule (DIS) for deriving DSM-IV diagnoses were included at follow-up as well.* ***Results:*** *Of the subjects with deviant YSR Total Problem scores, 23% (males) and 22% (females) had deviant YASR Total Problem scores at follow-up. Subjects with initial deviant YSR Total Problem, Internalizing, and Externalizing scores had higher prevalences of DSM-IV diagnoses at follow-up. Associations between adolescent and adulthood psychopathology were different for males versus females.* ***Conclusions:*** *Adolescent problems tended to persist into adulthood to a moderate degree. High rates of problems during adolescence are risk factors for psychiatric disorders in adulthood. Sex differences in continuities from adolescence into adulthood argue against basing assumptions concerning the etiology or treatment about both sexes on findings from one sex.*

Introduction

Knowledge of the course of psychopathology from adolescence into adulthood is indispensable for answering questions regarding the origins of adult psychopathology as well as questions concerning the prognosis of psychopathology across a wide age range. Various methodological limitations have hampered findings in this area, such as reliance on clinical samples, which limits the generalizability of findings because clinical samples are confounded by referral biases (Caron and

Rutter, 1991); the use of retrospective designs, resulting in possible distortions in reporting or recall (Verhulst, 1995); and the focus on a limited range of behaviors, without taking account of comorbidity (Caron and Rutter, 1991). Among longitudinal studies of relations between adolescent and adult psychopathology in general population samples, three pertained to a broad range of psychopathology: the Dunedin study, New Zealand (Feehan et al., 1993; Newman et al., 1996); the National sample study, United States (Achenbach et al., 1995b); and the Zuid-Holland study, the Netherlands (Ferdinand and Verhulst, 1995a). In general, it was found that the stability of problems from adolescence into young-adulthood was considerable, ranging from moderate to high, and dependent on the length of the study interval, the assessment procedures that were used, and the sample itself.

In testing the accuracy with which parent-reported behavioral and emotional problems predicted adult problems 14 years later, we found that withdrawal and social problems were especially good predictors of adult malfunctioning (Hofstra et al., 2000). However, other studies have shown that different informants (i.e., parents, subjects themselves) make different contributions to the prediction of psychopathology (Verhulst and Van der Ende, 1992a; Verhulst et al., 1997a). Thus, self-reports should be used as well, when testing predictions of psychopathology.

Therefore, the main aim of the present epidemiological study was to determine the 10-year course and predictive value of self-reported problems in adolescents from the general population. Subjects were initially assessed at ages 11-19 years using the Youth Self-Report (YSR; Achenbach, 1991c), a self-report questionnaire covering a broad range of behavioral and emotional problems. At 10-year follow-up, self-reports were obtained and a DSM-IV (American Psychiatric Association, 1994) diagnostic interview was administered.

Method

Sample and Procedure

The original sample consisted of children aged 4- to 16-years, drawn in 1983 from the Dutch province of Zuid-Holland. Using municipal registers that list all residents, a random sample of 100 children of each sex and each year cohort with Dutch nationality was drawn (n = 2,600). Of the parents of the 2,447 target children who were reached, 2,076 (84.8%) completed a Child Behavior Checklist (CBCL;

Achenbach, 1991a) on their child. After the first assessment (1983, time 1), the sample was approached again in 1985 (time 2), 1987 (time 3), 1989 (time 4), 1991 (time 5), and 1997 (time 6). For details of the initial data collection, see Verhulst et al. (1985a; 1985b).

The present study presents data from time 3 (1987) and time 6 (1997). Subjects who belonged to the age cohorts 7-14 at time 1 were asked to complete Youth Self-Reports (YSR; Achenbach, 1991c; Verhulst et al., 1997b) at time 3, ages 11-19 years, and Young Adult Self-Reports (YASR; Achenbach, 1997) at time 6, ages 21-29 years.

At time 3, interviewers visited the 11- to 16-year-olds and gave them a YSR, instructions, a postpaid return envelope, and a letter explaining the aims of the study. Subjects aged 17 years or older were contacted by mail. A total of 939 YSRs was obtained, which comprised 73.3% of all 11- to 17-year-olds at time 3 (n = 1,281) (see Verhulst et al., 1989, for details).

At time 6, we sought to contact all subjects in the original time 1 sample of 2,076, except 8 who had died, 12 who had severe mental handicaps, 59 who had emigrated, and 14 who had requested removal from the sample. Of the subjects who were reached, 36 declined to be interviewed, but completed YASRs by mail, while 1,582 subjects cooperated with an interview which included the administration of the YASR followed by the Composite International Diagnostic Interview (CIDI; World Health Organization, 1992) and three sections of the Diagnostic Interview Schedule (DIS; Robins et al., 1997). Of the 1,582 CIDI-DIS interviews that were administered, 1,578 provided complete information and of the 1,618 YASRs, 1,615 were usable. This comprised 79.0% and 80.9% of the time 1 sample, respectively (response rate corrected for deceased subjects, subjects with mental handicaps, and subjects who had emigrated).

Attrition. At time 1, 1,281 parents of 7- to 14-year-olds completed CBCLs. The 802 individuals (365 males and 437 females) on whom we obtained YSRs or YASRs at both time 3 and time 6 formed 62.6% of the original time 1 sample on whom we obtained CBCLs from parents. Of these 802 subjects, 13 (4 males and 9 females) did not cooperate with a complete interview and therefore no CIDI-DIS information was obtained. To assess selective attrition, we compared drop-outs (n = 479) and remainers (n = 802) with respect to age, sex, 1983 CBCL Total

Problem scores, and their parents' socioeconomic status (SES) at time 1. SES was assessed using a six-point scale of parental occupation (Van Westerlaak et al., 1975), with '1' = lowest SES. Drop-outs and remainers differed slightly but significantly in age (mean age at time 1 was 10.8 years for drop-outs versus 10.3 years for remainers; $t = 3.97$; $df = 1279$; $p < .001$), and more females than males remained (66.9% versus 58.1%; $n = 1,281$; $\chi^2 = 10.59$; $df = 1$; $p < .001$). Drop-outs and remainers did not differ significantly in time 1 CBCL mean Total Problem scores (21.9 for drop-outs and 20.5 for remainers; $t = 1.39$; $df = 873$; $p = .16$). The mean SES for drop-outs was slightly, though significantly, lower than that for remainers (3.4 for drop-outs and 3.7 for remainers; $t = -2.52$; $df = 1276$; $p < .05$). The finding that drop-outs did not have significantly higher problem scores at time 1 supported the representativeness of the follow-up sample with respect to initial problem levels. The higher SES for remainers versus drop-outs indicates that remainers may have experienced somewhat more favorable environmental circumstances than drop-outs.

Instruments

The Youth Self-Report. The Youth Self-Report (YSR; Achenbach, 1991c; Verhulst et al., 1997b) is a self-report questionnaire for ages 11- to 18- year-olds, and was modeled on the Child Behavior Checklist, a parent questionnaire for the assessment of psychopathology in children and adolescents (CBCL; Achenbach, 1991a). The YSR has the same format as the CBCL, except that YSR items are worded in the first person. It consists of items assessing activities, social relationships, and academic performance, plus 103 items covering emotional and behavioral problems during the previous six months, and 16 socially desirable items. The response format for the problem items is 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true. A Total Problem score is derived by summing the scores for each problem item. The YSR can be scored on eight narrow-band syndromes: Withdrawn, Somatic Complaints, Anxious/Depressed (together constituting the Internalizing scale), Delinquent Behavior, Aggressive Behavior (together constituting the Externalizing scale), Social Problems, Thought Problems, and Attention Problems. The good reliability and validity of the YSR (Achenbach,

1991c) were supported for the Dutch version (De Groot et al., 1996; Verhulst et al., 1997b).

The Young Adult Self-Report. The Young Adult Self-Report (YASR; Achenbach, 1997) is a questionnaire for 18- to 30-year-olds. It contains 110 problem items. Nine YSR problem items that are specific for younger subjects were replaced by problems pertaining to adults, and seven items were added to the original YSR. Similar to the YSR, the problem items can be scored "0", "1", and "2". The YASR can be scored on eight narrow-band syndromes: Withdrawn, Anxious/Depressed (together constituting the Internalizing scale), Intrusive Behavior, Delinquent Behavior, Aggressive Behavior (together constituting the Externalizing scale), Somatic Complaints, Thought Problems, and Attention Problems. Good reliability and validity for the American YASR have been reported by Achenbach (1997) and were supported for the Dutch version (Ferdinand et al., 1995; Wiznitzer et al., 1992).

The Composite International Diagnostic Interview and the Diagnostic Interview Schedule. The computerized version of the Composite International Diagnostic Interview (CIDI; World Health Organization, 1992) and three sections of the Diagnostic Interview Schedule (DIS; Robins et al., 1997) were used to obtain diagnoses of mental disorder in the 12 months prior to the interview. The CIDI and DIS are fully structured interviews to allow administration by lay interviewers. The CIDI has some 300 questions chosen to cover the criteria for DSM-IV (American Psychiatric Association, 1994) diagnoses and diagnoses are scored by computer. No information on the reliability and validity of the CIDI in the Dutch situation is available yet, but good reliability and validity have been reported for the American CIDI (Andrews and Peters, 1998). Because the CIDI lacks diagnoses of disruptive disorders (oppositional defiant disorder, antisocial personality disorder, and attention deficit hyperactivity disorder), three sections of the DIS covering these disorders were translated into Dutch and administered following the CIDI interview. Each CIDI-DIS interview was conducted by a lay interviewer, trained by the Dutch WHO training center.

For the present study, we used the following groupings of psychiatric disorders: (1) *any disorder*, consisting of anxiety disorders, mood disorders, substance abuse/dependence, disruptive disorders, and other disorders such as somatization, conversion, pain disorder, hypochondriasis, and brief psychotic disorder, or any

combination of these disorders; (2) *anxiety disorders*, consisting of generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, agoraphobia, social phobia, specific phobia, or any combination of these disorders; (3) *mood disorders*, consisting of major depressive episode, bipolar disorder, dysthymia, or any combination of these disorders; (4) *substance abuse/dependence*, consisting of alcohol abuse/dependence, drug abuse/dependence, or both; and (5) *disruptive disorders*, consisting of oppositional defiant disorder, antisocial personality disorder, attention deficit hyperactivity disorder, attention deficit only, hyperactivity only, or any combination of these disorders.

Results

Ten-Year Stability

We computed correlation coefficients (r's) between syndrome scores at initial assessment (1987) on the Youth Self-Report (YSR) and at 10-year follow-up on the Young Adult Self-Report (YASR), for males and females, and for two age groups (ages 11 to 14, and 15 to 19 years at initial assessment) separately, with the alpha level at $p < .05$, to investigate stability of problem behavior. No adjustment for multiple testing was made (Rothman, 1990). We used Cohen's (1988) criteria to evaluate the magnitude of correlations: small (r = .10 to .29), medium (r = .30 to .49), or large ($r \geq .50$).

As can be seen in Table 5.1, the correlations between YSR scores at initial assessment and YASR scores at 10-year follow-up were small to medium with the exception of the correlation for the total problem score for older males (r = .53), which was large according to Cohen's (1988) criteria.

To test the significance of differences between independent correlation coefficients, we used Fisher's z transformation of r. The correlations for the older age group were generally larger than those for the younger age group. The differences between age groups were significant for the Withdrawn, Thought Problems, Internalizing, and Total Problem scores.

When age was not taken into account, the correlations for males and females did not differ significantly, but within the younger age group the correlation for Externalizing scores was higher for females than for males. To assess differences in

correlations for Externalizing versus Internalizing scores, we used Steiger's (1980) method for comparing dependent correlations. The correlations of the Externalizing

Table 5.1

Ten-year correlations (r) between YSR scores at time 3 (1987) and YASR scores at time 6 (1997)

	Males (n=365)		Females (n=437)		
Syndrome	11-14 (n=188)	15-19 (n=177)	11-14 (n=202)	15-19 (n=235)	r total sample (n=802)
Withdrawn	.15	.44[o,so]	.32	.41[o]	.34
Somatic Complaints	.21	.32	.36	.27	.31
Anxious/Depressed	.32	.42	.31	.39	.39
Thought Problems	.13*	.22[o]	.09*	.34[o,so]	.20
Attention Problems	.19	.39[so]	.24	.28	.28
Aggressive Behavior	.30	.42	.36	.33	.35
Delinquent Behavior	.15	.23	.21	.37	.24
Internalizing	.28	.46[o,so]	.34	.40[o]	.40
Externalizing	.26	.44	.44[fy]	.48	.40
Total Problem score	.33	.53[o,so]	.38	.43[o]	.42

Note. YSR indicates Youth Self-Report; YASR indicates Young Adult Self-Report; α = .05; * = not significant (p > .05); o = significantly higher r values for older than for younger age group, regardless of sex; so = significantly higher r values for older than for younger age group, within sex; fy = significantly higher r values for females than for males, within age group.

versus Internalizing scores did not differ significantly for males or females, nor for older or younger subjects.

Prediction of Syndromes at Follow-Up

To determine whether individuals with scores indicating deviant behavior at initial assessment on the YSR syndromes were at risk for specific problems at follow-up, we performed linear regression analyses for each YASR syndrome separately. Three sets of analyses were performed: one containing the YSR narrow-band syndromes as candidate predictor variables, one containing the Internalizing and Externalizing scores as candidate predictor variables, and one containing the Total Problem score as candidate predictor variable. Each analysis included age at initial assessment (range 11-19 years) and SES (range 1-6) as candidate predictor

variables. The analyses were performed separately for males (n = 365) and females (n = 437), as summarized in Table 5.2.

Table 5.2

Time 3 predictors for YASR syndrome scores at time 6 for males (n=365) and females (n=437)

	Males			Females		
Syndrome at follow-up	Predictor from initial assessment	Beta	Adj. R^2	Predictor from initial assessment	Beta	Adj. R^2
Withdrawn	Withdrawn	.35	.11	Withdrawn	.33	.11
	Thought Problems	.28				
Somatic Complaints	Somatic Complaints	.15	.10	Somatic Complaints	.26	.07
	Aggressive Behavior	.15				
	Withdrawn	.13				
Anxious/Depressed	Anxious/Depressed	.37	.13	Anxious/Depressed	.25	.17
				Withdrawn	.18	
				Thought Problems	.15	
				Social Problems	-.14	
Thought Problems	Anxious/Depressed	.18	.04	Thought Problems	.23	.05
Attention Problems	Thought Problems	.18	.16	Attention Problems	.21	.08
	Anxious/Depressed	.16		Thought Problems	.13	
	Age	-.14				
Intrusive Behavior	Aggressive Behavior	.24	.12	Aggressive Behavior	.40	.15
	Somatic Complaints	.15		Age	-.13	
	Age	-.14				

Table 5.2 continues

Table 5.2 (continued)

	Males			Females		
Syndrome at follow-up	Predictor from initial assessment	Beta	Adj. R^2	Predictor from initial assessment	Beta	Adj. R^2
Aggressive Behavior	Aggressive Behavior	.31	.15	Aggressive Behavior	.28	.12
	Withdrawn	.15		Withdrawn	.13	
				SES	-.10	
Delinquent Behavior	Delinquent Behavior	.19	.04	Delinquent Behavior	.18	.13
	Age	-.11		Thought Problems	.18	
				Aggressive Behavior	.14	
				Social Problems	-.17	
Internalizing	Internalizing	.37	.14	Internalizing	.36	.13
Externalizing	Externalizing	.27	.15	Externalizing	.44	.19
	Internalizing	.14				
	Age	-.12				
Total Problem score	Total Problem score	.44	.19	Total Problem score	.40	.16

Note. Three sets of linear regression analyses were performed: analyses for narrow-band syndromes as predictors of later narrow-band syndromes; Internalizing and Externalizing scores as predictors of later Internalizing and Externalizing scores; and Total Problem score as predictor of later Total Problem score; all sets included SES and age. YSR, Youth self-Report; SES, parental socioeconomic status (1987) ranging from 1-6 (1 = lowest), age ranged from 11 to 19 years in 1987; YASR, Young Adult Self-Report.

Overall, the proportions of explained variance (Adjusted R^2) were low (i.e., between 2% and 13% of explained variance) to medium (i.e., between 13% and 26% of explained variance) according to Cohen's (1988) criteria. The following YASR syndromes were best predicted, in both males and females, by their YSR counterparts: Withdrawn, Somatic Complaints, Anxious/Depressed, Aggressive

Behavior, and Delinquent Behavior. For females it was found that high scores on the YSR Social Problems syndrome protected against high scores on the YASR Delinquent Behavior and Anxious/Depressed syndromes. Age was a significant predictor of the YASR Attention Problems, Delinquent Behavior, and Externalizing syndromes only in males, and of the Intrusive Behavior syndrome in both males and females, with younger ages having higher scores. SES was not a significant predictor among males. In females, lower SES predicted high scores on the YASR Aggressive Behavior syndrome.

Continuity and Change at a Categorical Level

To assess the course of problems in subjects who scored in the deviant range at initial assessment, we applied a categorical approach. The 90th percentile of the cumulative frequency distributions of syndrome scores on the YSR was used as the cutoff above which subjects were regarded as deviant at time 3, while the 90th percentile of the syndrome scores on the YASR was used for this purpose at follow-up. In this way, only a small group of subjects from the general population is regarded as showing deviant behavior.

The 50th percentile of the cumulative frequency distribution of syndrome scores on the YSR (time 3) and the YASR (time 6) was chosen as the arbitrary level below which individuals were considered to function well. The use of the 50th percentile enabled us to identify individuals whose functioning improved or worsened considerably across time. Cutoffs were determined for each sex separately.

Total Problem Scores. Figures 5.1 and 5.2 show the results of applying the 90th percentile and the 50th percentile to the total problem score, for males and females respectively. Across the whole sample, 2.4% (n = 19) of the subjects scored above the 90th percentile on the total problem score at both assessments. For males who scored above the 90th percentile at time 3, the probability of scoring above the 90th percentile at time 6 was significantly greater than for males who scored below the 50th percentile at time 3 (χ^2 = 18.8, df = 1, p < .001). The same was true for females who scored above the 90th percentile at time 3 (χ^2 = 20.4, df = 1, p < .001).

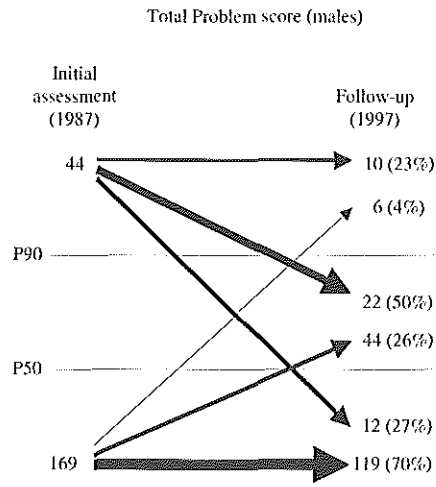

Fig. 5.1 Developmental pathways of the 44 male adolescents with initial YSR Total Problem scores above the P90 (upper left) and of the 169 male adolescents with initial YSR Total Problem scores below the P50 (lower left). The figure should be read from left to right, from the initial assessment to the follow-up assessment. Dotted lines indicate the P90 border (top) or the P50 border (bottom). Entries indicate numbers of adolescents. Percentages in parentheses.

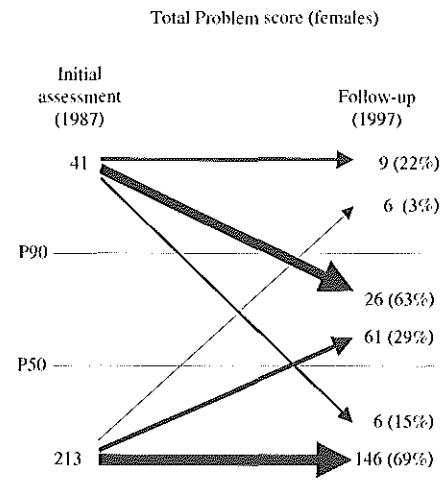

Fig. 5.2 Developmental pathways of the 41 female adolescents with initial YSR Total Problem scores above the P90 (upper left) and of the 213 female adolescents with initial YSR Total Problem scores below the P50 (lower left). The figure should be read from left to right, from the initial assessment to the follow-up assessment. Dotted lines indicate the P90 border (top) or the P50 border (bottom). Entries indicate numbers of adolescents. Percentages in parentheses.

Internalizing and Externalizing Scores. Of the males who scored above the 90th percentile on the Internalizing scale at time 3 (n = 40), 10 (25.0%) scored above the 90th percentile at time 6, while 22 (55.0%) scored between the 50th and 90th percentiles, and 8 (20.0%) scored below the 50th percentile.

Of the 43 females who scored above the 90th percentile at time 3, 11 (25.6%) scored above the 90th percentile at time 6, while 17 (39.5%) scored between the 50th and 90th percentiles, and 15 (34.9%) scored below the 50th percentile. Of the males who scored above the 90th percentile on the Externalizing scale at time 3 (n = 44), 8 (18.2%) scored above the 90th percentile at time 6, while 24 (54.5%) scored between the 50th and 90th percentiles, and 12 (27.3%) scored below the 50th percentile. Of the 42 females who scored above the 90th percentile at time 3, 8 (19.0%) scored above the 90th percentile at time 6, while 23 (54.8%) scored between the 50th and 90th percentiles, and 11 (26.2%) scored below the 50th percentile.

Prediction of DSM-IV diagnoses

Figures 5.3 and 5.4 show the 1-year prevalences of any DSM-IV disorder and of 4 groups of specific DSM-IV disorders for adult subjects at follow-up with Total Problem scores above the 90th percentile in adolescence and the prevalences for subjects with scores below the 90th percentile, separately for males and females. The sample base rate for each disorder is indicated. A consistent finding, although not always significant, was that subjects with total problem scores above the 90th percentile in adolescence had higher rates of psychiatric disorders 10-years later, compared to subjects with scores below the 90th percentile at time 3. A similar pattern was found for Internalizing and Externalizing scores above the 90th percentile versus below the 90th percentile.

To determine which YSR syndromes assessed in adolescence, predict later DSM-IV diagnoses, we performed three separate sets of multivariate logistic regression analyses with each group of DSM-IV disorders in adulthood as outcomes. Each analysis included age (11-14 = 0 versus 15-19 years = 1), and SES (1 = low (1,2,3) versus 0 = high (4,5,6)) at time 3 as candidate predictor variables. Analyses were performed for males (n = 361) and females (n = 428) separately, because of the significant differences in prevalence for males and females. Table 5.3 shows the

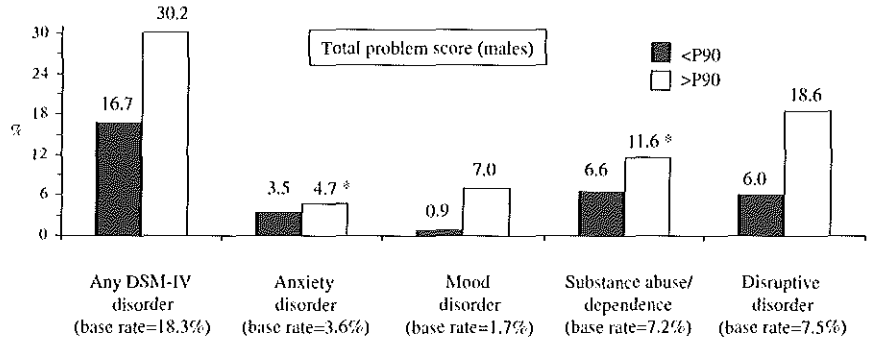

Fig 5.3 Adult DSM-IV disorders for those with adolescent scores <P90 or >P90 on the YSR Total Problem score scale, for males. * non significant ($p > 0.05$) difference in prevalences for adolescent scores <P90 and >P90 was found.

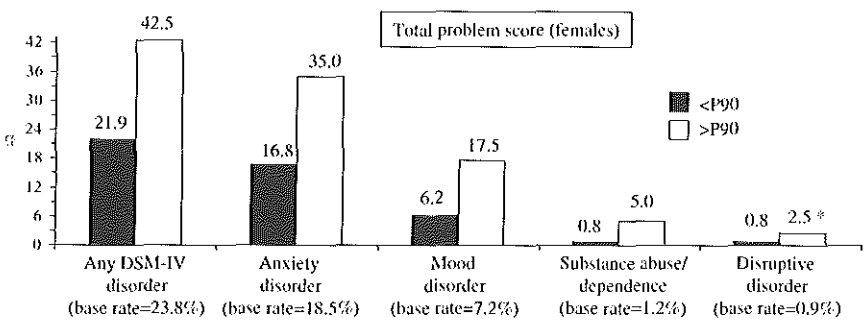

Fig. 5.4 Adult DSM-IV disorders for those with adolescent scores <P90 or >P90 on the YSR Total Problem score scale, for females. * non significant ($p > 0.05$) difference in prevalences for adolescent scores <P90 and >P90 was found.

results of the set of analyses with the YSR narrow-band syndromes as candidate predictor variables. For males, we found that scores in the deviant range on the YSR Delinquent Behavior syndrome predicted disruptive disorders and any DSM-IV disorder in adulthood. Neither age nor SES were significant predictors. For females, we found that scores in the deviant range on the YSR Somatic Complaints syndrome predicted anxiety disorders and any DSM-IV disorder at follow-up. Mood disorders in adulthood were predicted by scores in the deviant range on the YSR Thought Problems syndrome and also by SES, with low SES females having more mood disorders at follow-up. Furthermore, scores in the deviant range on the Aggressive Behavior syndrome predicted both substance abuse/dependence and disruptive disorders in female adults.

When looking at the Internalizing and Externalizing scales as candidate predictor variables we found that, for males, disruptive disorders and any DSM-IV disorder were predicted by the Externalizing scale (odds ratio (= OR), 4.3; 95% confidence interval (= 95% CI), 1.7-10.7, and OR, 2.4; 95% CI, 1.1-5.0). For females, both substance abuse/dependence and disruptive disorders were predicted by the Externalizing scale (OR, 7.5; 95% CI, 1.2-46.2 and OR, 34.7; 95% CI, 3.5-343.1). The total problem score predicted disruptive disorders in adult males (OR, 4.4; 95% CI, 1.8-11.1). In females, anxiety disorders (OR, 3.0; 95% CI, 1.4-6.4), mood disorders (OR, 3.6; 95% CI, 1.3-9.6), substance abuse/dependence (OR, 8.3; 95% CI, 1.3-51.4), and any DSM-IV disorder (OR, 3.2; 95% CI, 1.5-6.6) were predicted by YSR Total Problem scores in the deviant range. SES was a significant predictor as well, with low SES females having more mood disorders in adulthood (OR, 2.6; 95% CI, 1.04-6.6).

Discussion

The present study is, to our knowledge, unique in assessing psychopathology across the transition from adolescence into adulthood over a 10-year period, and using a questionnaire and a diagnostic interview at follow-up. The results from the current study yield evidence for the continuity of psychopathology across the transition from adolescence well into adulthood. When looking at correlations across these 10 years, considerable stability of problems was found. In addition, we found that a substantial part of the subjects with high scores in adolescence still had

Table 5.3

Multivariate odds ratios for time 3 predictors and time 6 DSM-IV diagnoses for males (n=361) and females (n=428)

	Males				Females			
DSM-IV diagnosis at follow-up	Predictor from initial assessment	Odds Ratio	95% CI	Goodness of fit	Predictor from initial assessment	Odds Ratio	95% CI	Goodness of fit
Any DSM diagnosis	Delinquent Behavior	2.8	1.4-5.4	337.0	Somatic Complaints	2.8	1.5-5.4	407.0
Anxiety disorders	--	--	--	--	Somatic Complaints	3.4	1.8-6.6	406.9
Mood disorders	--	--	--	--	Thought Problems*	2.9	1.1-7.8	386.2
Substance abuse/dependence	--	--	--	--	Aggressive Behavior	8.0	1.3-49.6	407.0
Disruptive disorders	Delinquent Behavior	5.7	2.4-13.4	337.0	Thought Problems	14.2	1.2-162.7	104.2
					Aggressive Behavior	16.8	1.5-191.4	

Note. All data are given as significant ($p < .05$) multivariate odds ratios (95% confidence intervals). * Socioeconomic status was an additional predictor: lower SES females had more mood disorders in adulthood (odds ratio, 2.6; 95% confidence interval, 1.04-6.6).

problems in adulthood. These results extend findings from prior studies on the continuity and change of psychopathology from adolescence into (young) adulthood, using general population samples (i.e., the National sample study, United States (Achenbach et al., 1995b) and results from an earlier stage of the current study (Ferdinand and Verhulst, 1995a).

Furthermore, our results provide evidence that adolescents with high levels of emotional and behavioral problems are more likely to meet criteria for DSM-IV diagnoses in adulthood.

Prediction of Syndromes

A number of syndromes in adulthood were best predicted by their adolescent counterparts (i.e., Withdrawn, Somatic Complaints, Anxious/Depressed, Aggressive Behavior, and Delinquent Behavior), indicating the long-term continuity of these problems. The other YASR syndromes either had no direct adolescent counterpart (i.e., Intrusive Behavior) or were not predicted by their counterparts, which might reflect a developmental shift from one problem area toward another during the transition from adolescence to adulthood.

Age Differences. An age effect was found for several syndromes; older males were less likely to obtain high scores on the YASR Attention Problems, Delinquent Behavior, and Externalizing scales, and both older males and females, were less likely to obtain high scores on the Intrusive Behavior syndrome at follow-up. This finding is in agreement with prior studies, which reported that the level of antisocial activities drops in adult life (Robins et al., 1991; Cohen et al., 1993b).

Social Problems. In females, high scores on the YSR Social Problems syndrome were protective for obtaining high scores on the Delinquent Behavior syndrome at follow-up. This finding extends results from a 6-year follow-up of 4- to 12-year-olds by Achenbach et al. (1995a). Achenbach et al. (1995a) also found that Social Problems negatively predicted Delinquent Behavior, only in girls. It may be that girls who do not get along with peers, who get teased, or who are not liked by peers, are less likely to engage in deviant peer relationships, which have been shown, in longitudinal studies, to play an independent role in both the initiation (studied in a sample of boys; (Keenan et al., 1995) and the continuity (Fergusson and Horwood, 1996) of delinquency in adolescence. In addition, high scores on the YSR Social

Problems syndrome in girls were also protective for obtaining high scores on the Anxious/Depressed syndrome at 10-year follow-up.

Attention Problems. Most studies pertaining to the outcomes of children with Attention Deficit/Hyperactivity Disorder (ADHD) come to the conclusion that these children have a poor outcome (Taylor, 1999). These studies often involve clinically referred children who frequently have many problems besides ADHD for which the authors did not adjust. Furthermore, most studies that determined the outcome of childhood ADHD did not extend their follow-up beyond adolescence.

In our study the YSR scale Attention Problems including items such as can't concentrate, can't sit still, impulsive, and clumsy, was found to be of only small predictive value for later Attention Problems in females but not in males and of no predictive value for later Aggressive Behavior, Delinquent Behavior, or Intrusive Behavior after adjusting for the associations with the other YSR scales. This negative finding is in accord with the findings by Fergusson et al (1997) who studied a birth cohort of New Zealand children. They found that attention problems at age 8 were not related to juvenile offending or substance abuse at age 18 after adjustment for confounding factors such as early conduct problems. However, attention problems were related to later poor academic success even after adjustment for confounding factors.

Prediction of DSM-IV Diagnoses

Our results showed that both males and females who showed deviant behavior (scores above the 90th percentile) in adolescence had higher rates of DSM-IV disorders at 10-year follow-up than subjects not showing deviant behavior in adolescence. These findings indicate that individuals with behavioral and emotional problems in adolescence run a greater risk for meeting criteria for DSM-IV diagnoses in adulthood.

Specific Phobia. Specific phobia, as part of the anxiety disorders, was found to be a common disorder among females; 11.4% of all females met criteria for a specific phobia. And as such, specific phobias form a large part of the any disorder category in adult females. One can imagine that specific phobias need not be associated with great impairment of overall functioning; as long as the circumscribed object or situation on which the unreasonable fear is focussed does

not occur or can be easily avoided, the individual does not have to have symptoms of anxiety and may lead an undisturbed everyday life. On the other hand, specific phobias have been recognized as risk factors for the development of disorders such as major depression and alcoholism, albeit in a retrospective study in a general population sample aged 15 through 54 (i.e., the National Comorbidity Survey; Kessler et al., 1996; 1997). The authors also concluded that the number of fears may mark a general predisposition to psychopathology (Curtis et al., 1998). These findings support the choice to include specific phobias in the DSM-IV categories of disorders in the present study.

Sex Differences. Our findings indicate sex differences in the developmental pathways from adolescent YSR scales to adult DSM-IV disorders. The YSR Total Problem score as a general indicator of malfunctioning in adolescence was associated with more diverse problems among females (i.e., anxiety disorders, mood disorders and substance abuse/dependence) than among males (i.e., disruptive disorders). It thus seems that when high levels of general psychopathology are present in adolescent girls, they are more likely to display a broad range of psychopathology in adulthood than when this is the case in adolescent boys. The sex differences in the continuities from adolescence to adulthood argue against basing assumptions concerning the etiology or treatment about both sexes on findings from one sex.

Substance Abuse/Dependence. In adult females, DSM-IV substance abuse/dependence, which consisted mainly of alcohol abuse/dependence, was predicted by scores in the deviant range on the YSR Aggressive Behavior syndrome. This syndrome consists of items relating to overt aggression, such as arguing, being mean to others, destroying own or others' things, fighting, and attacking other people. This finding is in concord with findings from a diversity of studies in which a longitudinal link was found between childhood antisocial behavior/aggression and later alcoholism (for review, see Zucker et al., 1995). Surprisingly, in our study initial behavioral and emotional problems in males did not predict substance abuse/dependence in adulthood, whereas earlier studies using different assessment procedures and criteria for defining abuse did find a longitudinal link. Our findings imply that in males alcohol abuse/dependence tend to emerge de novo in adulthood without earlier signs of psychopathology, but that in females alcohol abuse/

dependence is preceded by aggressive behaviors. It may be that, using similar DSM-IV criteria for alcohol abuse/dependence for both sexes identified males whose alcohol consumption is relatively normative and to a lesser degree a sign of general malfunctioning than the use of alcohol in females. This would argue against using the same diagnostic criteria for both sexes.

Disruptive Disorders. Our results showed that disruptive disorders in adult males were strongly predicted by scores in the deviant range on the YSR Delinquent Behavior syndrome. The finding that externalizing behaviors in childhood predicted adult disruptive disorder is consistent with findings from several previous studies (for review, see Maughan and Rutter, 1998).

Conclusions and Clinical Implications

The present study showed that, for both males and females, self-reported problem behavior continued from adolescence into adulthood to a moderate degree. The present study was not designed to identify factors that may explain the underlying mechanisms of why some individuals remained problematic, while others seem to improve.

Furthermore, an important finding was that individuals with behavioral and emotional problems in adolescence run a greater risk for meeting criteria for DSM-IV diagnoses in adulthood. This finding signals the importance of intervention strategies in adolescence, to prevent continuity of these behavioral and emotional problems into adulthood. In addition, different longitudinal links between adolescent problems and later disorders were found for males versus females. The sex differences in adolescent-adult continuities may have implications for research and treatment, because these differences argue against automatically basing assumptions concerning etiology and treatment about both sexes on findings from one sex.

Clinical implications

- Assumptions concerning etiology and treatment about both sexes should not be based on findings from one sex;
- High rates of problems in adolescence are not transient and should therefore not be ignored;

- Individuals with behavioral and emotional problems in adolescence run a greater risk for meeting criteria for DSM-IV diagnoses in adulthood. Hence, these adolescents deserve attention from mental health professionals in terms of intervention and prevention.

Limitations

- The current study used information given by the adolescents themselves. Sole reliance on self-reports may have influenced our results;
- Because we did not include standardized information on treatment and help-seeking during the years of follow-up we do not know the effect of possible interventions on the course of problem behaviors from adolescence into adulthood;
- Historical aspects were not taken account of in the current study. The period in which the subjects grew up may have influenced the rates of psychopathology.

6 Pathways of Self-Reported Problem Behaviors From Adolescence Into Adulthood

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Chapter 6

Pathways of Self-Reported Problem Behaviors from Adolescence into Adulthood

Abstract

Objective: *We determined differences in adult outcome of contrasting developmental pathways of psychopathology in a general population sample of 705 individuals from ages 11-19 years to ages 21-29 years.* ***Method:*** *At four assessment points (1987, 1989, 1991, and 1997) self-reports were obtained, using the Youth Self-Report (YSR) and the Young-Adult Self-Report (YASR). In addition, DSM-IV diagnoses, information pertaining to signs of maladjustment, and measures of social functioning were obtained at follow-up. Four contrasting pathways of psychopathology were selected on the basis of the self-report ratings over four assessments: "persisters", "decreasers", "increasers", and "normals".* ***Results:*** *Subjects whose overall level of psychopathology persisted over time obtained more 12-months and lifetime DSM-IV diagnoses, and had a poorer general outcome in adulthood compared to subjects whose level of psychopathology increased across time. Subjects who followed a pathway that returned to normal after high levels of problems in adolescence, were only slightly different in terms of outcome from subjects who always scored normal.* ***Conclusions:*** *The findings emphasize the importance of a subject's history of emotional and behavioral problems in the assessment of problems in adulthood. The findings support the theoretical framework indicating that the longer an individual continues along a maladaptive pathway, the more difficult it is to reclaim a normal developmental trajectory.*

Introduction

Knowledge of the natural course of psychopathology from adolescence into adulthood is essential for our understanding of the development of psychopathology. One aspect of the development of psychopathology we still know little about, is the extent to which variations in individual trajectories of maladaptation affects the outcome. For instance, little is known about the effects of the duration of maladapted functioning during adolescence on the outcome in adulthood. It may be

that the more consistently a deviating pathway is followed over time, the more unlikely it becomes that a normal pathway can be reclaimed (Sroufe, 1989). However, there still is little empirical support for this hypothesis. Also little is known about the level of adaptation in adulthood once individuals with high levels of psychopathology in adolescence recovered during their development. It may be that earlier, temporary breakdown makes individuals more resilient and decreases the probability of later maladaptation (Andrews et al., 1993), or that earlier psychopathology will set off vulnerabilities which render individuals prone to future maladaptation (Rutter, 1989).

Few longitudinal general population studies exist that used comparable measures of psychopathology from adolescence into adulthood. Achenbach et al. (1995b) tested the 6-year continuities and predictive paths from adolescent syndromes (subjects aged 13-16 years) assessed with a parent rating scale, the Child Behavior Checklist (CBCL; Achenbach, 1991a) to adult syndromes (subjects aged 19-22 years) assessed with the Young Adult Self-Report and the Young Adult Behavior Checklist (YASR and YABCL; Achenbach, 1997), a self-report and parent rating scale respectively for assessing a wide range of psychopathology in young adult subjects. It was found that several young adult syndromes were strongly predicted by their adolescent counterparts. Ferdinand and Verhulst (1995a), at an earlier stage of the current longitudinal study, examined the 8-year stability of behavioral and emotional problems from adolescence into young adulthood. They found that of the individuals aged 13 through 16 years with CBCL total problem scores in the deviant range, 27.3% had YASR total problem scores in the deviant range at 8-year follow-up.

These studies elucidated the strength of the continuities of psychopathology from adolescence into young adulthood. However, these studies were less informative with respect to the variations in developmental pathways of psychopathology and its consequences for later adaptation.

The present longitudinal epidemiological study had its onset in adolescence (ages 11-19 years), and focuses on the impact of different pathways of psychopathology on outcomes in adulthood (ages 21-29 years) by classifying individuals on the basis of prospective information across four subsequent assessments spanning a 10-year interval. Self-report rating scales measuring a broad

range of psychopathology were used at all four assessments. At outcome a standardized diagnostic interview generating DSM-IV diagnoses was administered, and information on social functioning and on general signs of maladjustment was obtained.

Four groups of individuals were selected on the basis of their developmental trajectories: "persisters" containing individuals who could be regarded deviant at all four assessments; "decreasers" containing individuals who showed high levels of problems in adolescence but returned to normal in adulthood; "increasers" containing individuals who showed high levels of problems only in adulthood but not in adolescence, and "normals" containing individuals who had low levels of problems at all four assessments.

By assessing DSM-IV diagnoses, other signs of maladjustment such as referral to mental health services, suicide attempts, arrests, expulsion from school or job, and no education beyond elementary school, as well as indices of social functioning, we determined differences in outcome for each of the contrasting developmental trajectories of psychopathology from adolescence into adulthood.

Method

Sample and Procedure

The original sample consisted of children aged 4- to 16-years, drawn in 1983 from the Dutch province of Zuid-Holland. Using municipal registers that list all residents, a random sample of 100 children of each sex and age with Dutch nationality was drawn (n = 2,600). Of the parents of the 2,447 target children who were reached, 2,076 (84.8%) completed a Child Behavior Checklist (CBCL; Achenbach, 1991a) on their child. The first assessment was designated time 1 (see Verhulst et al. (1985a; 1985b), for details on the initial data collection).

The present study stemmed from follow-ups of the original sample. Subjects who were aged 7 to 14 years at time 1 were asked to complete self-reports in 1987 (time 3), 1989 (time 4), 1991 (time 5), and 1997 (time 6). Subjects whose parents declined to participate at time 1 were not contacted. To keep comparability with earlier publications based on this ongoing longitudinal study we retained the original indications of times of assessment.

In 1987 (time 3), parents of children and adolescents aged 7 to 12 in 1983 (time 1) who were 11-16 years at the third time of assessment were visited by an interviewer. The interviewer left a YSR, instructions, a postpaid return envelope for the adolescent, and a letter explaining the aims of the study. Subjects aged 13 or 14 in 1983 (time 1) who were 17 years or older in 1987 (time 3) were contacted by mail.

In 1989 (time 4), all adolescents originally aged 7 to 11 years in 1983 (13 to 17 years at time 4) were requested to complete the YSR for the second time. The same procedure as the one in 1987 was followed. Subjects aged 12 to 14 years in 1983 (18 to 22 years at time 4) were visited by an interviewer, who asked them to complete a YASR.

In 1991 (time 5), all adolescents aged 12 to 17 were requested to complete the YSR for the third time. The same procedure as the one in 1987 and 1989 was followed. Subjects aged 18 and up were visited by an interviewer who requested them to complete the YASR.

In 1997 (time 6), all subjects were visited by an interviewer and were requested to complete the YASR. An interview including the Composite International Diagnostic Interview (CIDI; World Health Organization, 1992) and three sections of the Diagnostic Interview Schedule (DIS; Robins et al., 1997) was administered as well. A small subsample of subjects (n = 36) who declined to be interviewed, was sent a YASR, with instructions, a postpaid return envelope, and a letter explaining the aims of the study.

Attrition. In 1983 (time 1), 1,285 parents of 7- to 14-year-olds completed CBCLs. The 705 individuals (310 males and 395 females) on whom we obtained complete information for the four assessments (time 3, 4, 5, and 6) formed 55.0% of the original (1983) sample on whom we obtained CBCLs from parents. To assess selective attrition, we compared drop-outs (n = 580) and remainers (n = 705) with respect to age, sex, 1983 CBCL Total Problem scores, and their parents' socioeconomic status (SES) at time 1. SES was assessed using a six-point scale of parental occupation (Van Westerlaak et al., 1975), with '1' = lowest SES. Drop-outs and remainers differed significantly in age distribution (mean age at time 1 was 10.8 years for drop-outs and 10.2 years for remainers; t = 4.4; df = 1283; $p < .001$); more females responded than males (60.4% of 654 versus 49.1% of 631; n = 705;

χ^2 = 16.47; *df* = 1; $p < .001$). The mean CBCL Total Problem score at time 1 for drop-outs was slightly, but significantly higher than that for remainers (22.3 for drop-outs and 20.0 for remainers; $t = 2.4$; *df* = 1099; $p = .017$). The mean SES for drop-outs was slightly, though significantly, lower than that for remainers (3.4 for drop-outs and 3.8 for remainers; $t = -4.38$; *df* = 1280; $p < .001$).

Contrasting Pathways of Psychopathology

Subjects were considered deviant when they scored above the cutoff for the total problem score, which was set at the 82nd percentile as recommended by Achenbach (1991a; 1997). Cutoffs were determined for each sex separately. The 50th percentile (P50) of the cumulative frequency distribution of the total problem score was chosen as the arbitrary level below which individuals were considered to function well. The use of the 50th percentile enabled us to identify individuals whose functioning improved or worsened considerably across time.

Persisters. Subjects (n = 22) were considered persisters if they scored in the deviant range at all four assessments, thus showing persistent deviant behavior from adolescence into adulthood.

Increasers. Subjects (n = 20) were considered increasers if they scored below the 50th percentile (P50) at initial assessment and in the deviant range at time 6.

Decreasers. Subjects (n = 32) were considered decreasers if they scored in the deviant range at time 1 but below the P50 at time 6.

Normals. To compare the other three groups with subjects that can be regarded as normal, we selected a fourth category consisting of subjects (n = 145) who scored under the P50 at all four assessments.

Ethics

Each assessment phase of this study was approved by the Committee for Medical Ethics, University Hospital Rotterdam/Erasmus University Rotterdam. Informed consent was obtained from all subjects who cooperated, after the procedure had been fully explained.

Instruments

Psychopathology

The Youth Self-Report. The Youth Self-Report (YSR; Achenbach, 1991c; Verhulst et al., 1997b) is a self-report questionnaire for ages 11- to 18- year-olds, and was modeled on the Child Behavior Checklist (CBCL; Achenbach, 1991a), a parent questionnaire for the assessment of psychopathology in children and adolescents. The YSR contains 103 items covering emotional and behavioral problems during the previous six months, and 16 socially desirable items. The response format for the problem items is 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true. A Total Problem score is derived by summing the scores for each problem item. The good reliability and validity of the YSR (Achenbach, 1991c) were supported for the Dutch version (De Groot et al., 1996; Verhulst et al., 1997b).

The Young Adult Self-Report. The Young Adult Self-Report (YASR; Achenbach, 1997) is a questionnaire for 18- to 30-year-olds. It contains 110 problem items that are scored in the same way as the YSR items. Nine YSR problem items that are specific for younger subjects were replaced by problems pertaining to adults, and seven items were added to the original YSR. Good reliability and validity for the American YASR have been reported by Achenbach (1997) and were supported for the Dutch version (Ferdinand et al., 1995; Wiznitzer et al., 1992).

To determine the course of psychopathology across time, YSR and YASR Total Problem scores were computed omitting items (12 YSR items, and 24 YASR items) that were not included in both instruments.

The Composite International Diagnostic Interview and the Diagnostic Interview Schedule. The computerized version of the Composite International Diagnostic Interview (CIDI; World Health Organization, 1992) and three sections of the Diagnostic Interview Schedule (DIS; Robins et al., 1997) were used to obtain DSM-IV diagnoses of mental disorder in the 12 months prior to the interview and to obtain lifetime diagnoses of mental disorder. The CIDI and DIS are fully structured interviews to allow administration by lay interviewers and scoring of diagnoses by computer. Good reliability and validity have been reported for the CIDI (Andrews and Peters, 1998). Because the CIDI lacks diagnoses of disruptive disorders (oppositional defiant disorder, antisocial personality disorder, and attention deficit

hyperactivity disorder), three sections of the DIS covering these disorders were translated into Dutch and administered. Each CIDI-DIS interview was conducted by a lay interviewer, trained by the Dutch WHO training center.

Because of small cell sizes for the individual disorders, we combined disorders into the following groupings: 1) any DSM-IV disorder; 2) anxiety disorders; 3) mood disorders; 4) substance abuse/dependence; and 5) disruptive disorders.

Overall Functioning

The Global Assessment Scale (GAS; Endicott et al., 1976) was used to evaluate the overall functioning of a subject during the 6 months preceding the interview. The Global Assessment Scale was scored by the interviewer after completion of the interview. The scale value ranges from 1 to 100, and is divided into ten equal intervals: 1 to 10, 11 to 20, and so on to 81 to 90 and 91 to 100. The highest interval (91-100) indicates good functioning, while lower scores indicate problems in functioning.

Signs of Maladjustment

Poor Outcome Events

At outcome, the following poor outcome events were assessed, indicating whether the subject (a) had been referred to mental health services; (b) had attempted suicide; (c) had been arrested by the police; (d) had been expelled from school or from a job, all in the preceding 12 months, and whether the subject (e) had only finished elementary school.

Signs of Impaired Social Functioning

Current social functioning was assessed with the Groningen Questionnaire about Social Behavior (GQSB; Van der Lubbe, 1995; De Jong and Van der Lubbe, 1994). Three subscales covering the following areas were assessed: 1) social activities (limited to activities with friends); 2) daily functioning (i.e., educational activities, employment, and housekeeping); and 3) spare time activities. The first two scales pertain to problems with interpersonal contacts, of the 6 items of the last subscale (i.e., spare time activities) 5 refer to the subject's satisfaction with the quality of his or her spare time activities. Subjects are asked to rate situations applicable to their

situation in the past four weeks. Each item has four response options, ranging from never to always. By summing the scores, a total score for each subscale is derived. These scores can be dichotomized by applying a cutoff. Subjects who scored above the cutoff are considered to be impaired on that specific subscale (De Jong and Van der Lubbe, 1994). Furthermore, of all subjects (n = 705), 26 did not have any close friends. They could not answer questions regarding social activities (limited to activities with friends), and therefore a separate sign of impaired social functioning was added: having no close friends.

Statistical Analyses

T-tests were used to test the significance of differences between mean scores. To test the significance of differences between the number of DSM-IV diagnoses, and signs of maladjustment for the four contrasting subsamples, χ^2-tests were used. Fisher's exact test (FET) significance levels were used for tables with cell sizes < 5. Analyses of variance were used to test group effects for GAS scores. All statistical tests were computed with SPSS 9.0 for Windows.

Limitations

The main limitation of the current study is the question concerning generalizability of findings. The sample used in the present study consisted of subjects who showed somewhat less behavioral and emotional problems in childhood than subjects who, at some point in time, refused to cooperate. This may have somewhat weakened our findings. Furthermore, because we did not include standardized information on treatment and help-seeking during the years of follow-up, we do not know the effect of possible interventions on the course of problem behaviors from adolescence into adulthood. Finally, the design of the present study did not enable us to take into account the influences of etiological factors on the development of psychopathology.

Results

Figure 6.1 shows the mean Total Problem scores for the four categories of longitudinal course: persisters, increasers, decreasers, and normals.

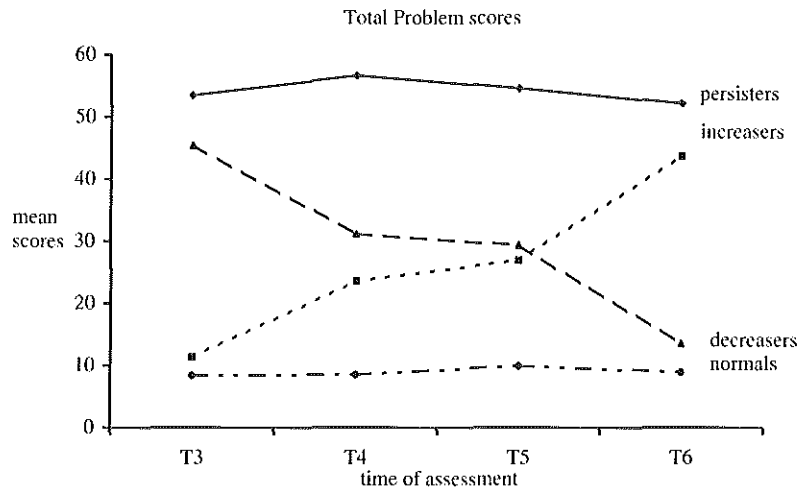

Fig. 6.1 Mean Total Problem scores across the 10-year follow-up for each longitudinal category

No significant difference was found between the mean Total Problem scores at follow-up for persisters and increasers (mean scores: 52.14 and 43.70 respectively; t = 1.85, df = 31, p = .07). The mean Total Problem score for decreasers was significantly higher than that normals at follow-up (13.44 and 8.90 respectively, t = 5.13, df = 175, p < .001).

DSM-IV Diagnoses

Table 6.1 shows the DSM-IV 12-months, as well as the DSM-IV lifetime diagnoses for each longitudinal category. Significant differences between the contrasting subsamples were found for the number of 12-months diagnoses of anxiety disorders, mood disorders, disruptive disorders, and any DSM-IV disorder. The same was true for the lifetime diagnoses of these groups of disorders. Increasers did not meet criteria for 12-months diagnoses of any disruptive disorder.

Persisters had significantly more DSM-IV 12-months and lifetime disorders (χ^2 = 4.6, df = 1, p = .03, and χ^2 = 5.1, df = 1, p = .04, respectively), and more 12-months and lifetime disruptive disorders (χ^2 = 6.4, df = 1, p = .02, and χ^2 = 6.1, df = 1, p = .02, respectively) than increasers. Decreasers and normals did not significantly differ in the prevalence of DSM-IV 12-months and lifetime disorders (χ^2 = 1.5, df = 1, p =.26, and χ^2 = 2.5, df = 1, p = .12, respectively),

Table 6.1

DSM-IV diagnoses in adulthood for each longitudinal category

	DSM-IV 12-months diagnosis				
	Persisters	Increasers	Decreasers	Normals	Statistics[a]
	(*n*=22)	(*n*=20)	(*n*=32)	(*n*=145)	
Male : Female	8 : 14	8 : 12	14 : 18	68 : 77	
Any DSM disorder	15 (68.2%)	7 (35.0%)	4 (12.5%)	9 (6.2%)	FET=47.5/*p*<.001
Anxiety disorders	6 (27.3%)	4 (20.0%)	2 (6.3%)	3 (2.1%)	FET=20.4/*p*<.001
Mood disorders	5 (22.7%)	2 (10.0%)	1 (3.1%)	2 (1.4%)	FET=15.6/*p*<.01
Substance abuse/dependence	2 (9.1%)	1 (5.0%)	1 (3.1%)	3 (2.1%)	FET=3.9/*p*=.17
Disruptive disorders	6 (27.3%)	--	1 (3.1%)	2 (1.4%)	FET=18.2/*p*<.001

Table 6.1 continues

Table 6.1 (continued)

	DSM-IV lifetime diagnosis				
	Persisters	Increasers	Decreasers	Normals	Statistics[a]
	(*n*=22)	(*n*=20)	(*n*=32)	(*n*=145)	
Male : Female	8 : 14	8 : 12	14 : 18	68 : 77	
Any DSM disorder	19 (86.4%)	11 (55.0%)	8 (25.0%)	20 (13.8%)	χ^2=60.9/*p*<.001
Anxiety disorders	10 (45.5%)	4 (20.0%)	2 (6.3%)	4 (2.8%)	FET=32.4/*p*<.001
Mood disorders	10 (45.5%)	6 (30.0%)	3 (9.4%)	4 (2.8%)	FET=36.4/*p*<.001
Substance abuse/dependence	5 (22.7%)	3 (15.0%)	4 (12.5%)	10 (6.9%)	FET=6.4/*p*=.07
Disruptive disorders	8 (36.4%)	1 (5.0%)	2 (6.3%)	4 (2.8%)	FET=21.4/*p*<.001

Note. Numbers indicate number of DSM-IV diagnoses, numbers in parentheses indicate percentages per longitudinal category. [a] FET = Fisher's exact test, χ^2 = Chi-square, *p* = level of significance; degrees of freedom was 3 in all models, exact tests were used for tables with cell sizes < 5.

nor in prevalence of any of the other categories of DSM-IV disorders.

Comorbidity

We calculated the comorbidity rate of DSM-IV 12-months diagnoses for each longitudinal category. Of the persisters 18.2% (n = 4), of the increasers 10.0% (n = 2), of the decreasers 6.3% (n = 2), and of the normals 0.7% (n = 1) met criteria for two or more diagnoses (FET, $p < .001$).

Signs of Maladjustment

We compared the four subsamples in the presence of signs of maladjustment at follow-up. The results are shown in Table 6.2. The level of overall functioning (GAS scores) of each subsample is indicated. A one-way analysis of variance with the four groups as independent, and the GAS scores as dependent variables, revealed a significant group effect (F = 28.9, df = 3, $p < .001$). Persisters had significantly lower mean GAS scores (t = -2.2, df = 36, p = .03) when compared to increasers. Decreasers and normals differed also significantly in mean GAS scores (t = -2.3, df = 166, p = .02).

Significant differences between the persisters, increasers, decreasers, and normals, in the presence of poor outcome events were found, using χ^2 tests, for the number of subjects being referred to mental health services, suicide attempts, and any poor outcome event (i.e., one or more outcome events). Furthermore, one persister had been arrested and one persister had been expelled from a job, in the 12 months preceding the interview. Persisters differed significantly from increasers on any poor outcome event (χ^2 = 5.2, df = 1, p = .04). No significant difference was found between decreasers and normals (χ^2 = 0.5, df = 1, p = 1.00).

When looking at signs of impaired social functioning, we found significant differences between the four contrasting subsamples for having no friends (i.e., two persisters did not have any close friends), and being impaired in social activities (limited to activities with friends), daily functioning (educational activities, employment, and housekeeping), and spare time activities. Persisters and increasers did not differ significantly on the overall scale (i.e., any sign of impaired social

Table 6.2

Signs of maladjustment in adulthood for each longitudinal category

	Persisters (n=22)	Increasers (n=20)	Decreasers (n=32)	Normals (n=145)	Statistics[a]
Mean GAS score[b]	69.5	80.2	87.5	91.2	F=33.6/p<.001
Poor outcome events					
Referral	4 (18.2%)	2 (10.0%)	–	2 (1.4%)	FET=13.3/p<.01
Suicide attempts	4 (18.2%)	–	–	–	FET=16.3/p<.001
Arrested by the police	1 (4.5%)	–	–	–	FET=6.1/p=.20
Expulsion from school or a job	1 (4.5%)	–	–	–	FET=6.1/p=.20
Only elementary school[c]	1 (4.5%)	–	1 (3.1%)	–	FET=6.5/p=.11
Any poor outcome event[d]	9 (40.9%)	2 (10.0%)	1 (3.1%)	2 (1.4%)	FET=31.3/p<.001

Table 6.2 continues

Table 6.2 (continued)

	Persisters (n=22)	Increasers (n=20)	Decreasers (n=32)	Normals (n=145)	Statistics[a]
Signs of impaired social functioning					
No close friends	2 (9.1%)	--	--	--	FET=8.7/p<.05
Social activities (GQSB)[e]	8 (40.0%)[g]	3 (15.0%)	4 (12.5%)	12 (8.3%)	FET=13.0/p<.01
Daily functioning (GQSB)[f]	11 (50.0%)	8 (40.0%)	4 (12.5%)	17 (11.7%)	FET=22.3/p<.001
Spare time activities (GQSB)	8 (36.4%)	6 (30.0%)	3 (9.4%)	5 (3.4%)	FET=21.2/p<.001
Any sign of impaired social functioning[h]	16 (72.7%)	14 (70.0%)	11 (34.4%)	31 (21.4%)	χ^2=37.0/p<.001
Any sign of maladjustment[i]	17 (77.3%)	14 (70.0%)	11 (34.4%)	32 (22.1%)	χ^2=39.2/p<.001

Note. Numbers indicate number of subjects, numbers in parentheses indicate percentages per longitudinal category. [a] F = analysis of variance, FET = Fisher's exact test, χ^2 = Chi-square, p = level of significance; degrees of freedom was 3 in all models, exact tests were used for tables with cell sizes < 5. [b] GAS = Global Assessment Scale, the lower the scores, the worse the functioning. [c] Obtaining no formal education beyond elementary school. [d] One or more poor outcome events. [e] GQSB = Groningen Questionnaire about Social Behavior; Social activities: limited to activities with friends. [f] Daily functioning: educational activities, employment, and housekeeping. [g] 2 out of 22 persisters did not have close friends, thus 8 of 20 persisters scored above the cutoff for this scale.

[h] One or more signs of impaired social functioning. [i] Any sign of maladjustment: one or more signs of the sum of any poor outcome event and any sign of impaired social functioning.

functioning) (χ^2 = 0.04, df = 1, p = .85), nor did decreasers and normals (χ^2 = 2.4, df = 1, p = .12).

Discussion

In this study, we determined differences in adult outcomes between four contrasting 10-year developmental pathways of psychopathology in a general population sample from ages 11-19 years to ages 21-29 years. The four groups of individuals who were selected on the basis of their developmental trajectories were: "persisters" (individuals who could be regarded deviant at each of the four assessments); "decreasers" (individuals who showed high levels of problems in adolescence but returned to normal in adulthood); "increasers" (individuals who showed high levels in adulthood but not in adolescence), and "normals" (individuals who had low levels of problems at each of the four assessments).

We wanted to know whether individuals with similar levels of psychopathology at outcome measured with the YASR, but who differed in developmental trajectories, also differed in the level of adaptation in adulthood. Although persisters did not differ significantly in their mean total problem scores on the YASR from increasers, both groups showed considerable differences in a number of other outcome variables in adulthood. Not only was the prevalence of any DSM-IV diagnoses, both lifetime and measured over the previous 12 months, more prevalent among persisters than among increasers, they also had a greater probability of having, in general, poor outcome events such as referral to mental health services, suicide attempts, arrests by the police, or expulsion from school or job. In addition, persisters had a significantly lower mean GAS score than increasers. In contrast, social functioning in adulthood seemed to be influenced to a lesser extent by earlier psychopathology, because no significant difference was found between the persisters and increasers for the category "any sign of impaired social functioning". However, when we determined the co-occurrence of signs of impaired social functioning in more detail, it was found that of the increasers only 1 individual (= 5%) had 2 and 1 individual (= 5%) had 3 signs of impaired social functioning, whereas persisters showed a higher rate of co-occurrence of signs of impaired social functioning (3 individuals (= 13.6%) with 2, and 5 individuals (= 22.7%) with 3 signs of impaired social functioning). Thus, impaired social functioning among persisters is

more pervasive and affects a broader range of every day life activities than impairment of social functioning among increasers.

Compared with adults who had quite similar levels of psychopathology at outcome but who showed normal functioning in adolescence, those who were persistently disturbed across the 10-year interval from adolescence onwards, had a greater probability of meeting criteria for a DSM-IV diagnosis, had lower mean GAS scores, a higher probability of poor outcome events, and more pervasive problems in social functioning. These findings converge to the conclusion that individuals who persistently showed high levels of psychopathology from adolescence into adulthood seem to be captured in a trajectory towards a broad range of signs of maladaptation in adulthood, and seem to be more vulnerable than those whose psychopathology emerged de novo during a later phase in their development towards adulthood. This fits well in the theoretical framework indicating that the more persistent a deviant pathway is followed, the more difficult it is to reclaim a normal developmental trajectory (e.g., Cicchetti and Cohen, 1995; Sroufe, 1989).

We also wanted to know whether individuals who reported normal levels of functioning at outcome measured with the YASR, but who differed in the developmental trajectories prior to the follow-up assessment, differed in their level of adaptation. Although decreasers showed slightly but significantly elevated YASR total problem scores at follow-up versus normals, except for the somewhat lower GAS scores for decreasers versus normals, we could not detect significant differences between both groups on any of the other 22 measures of maladaptation. It thus seems that the experience of having had high levels of problems in adolescence did not leave these individuals with greater vulnerability once their developmental pathway returned to normal in adulthood.

The overriding conclusion we can draw from this study's findings is that when psychopathology is chronic from adolescence into adulthood, the consequences for overall adaptive functioning reach beyond the mere level of psychopathology but extends to a broad range of maladaptive functioning. Compared to those whose psychopathology emerged de novo in young adulthood or adulthood, individuals in our sample whose deviance was chronic did much worse on most measures of adaptive functioning. In contrast, individuals who showed psychopathology at

earlier assessments during adolescence but who reclaimed a normal developmental pathway were nearly indistinguishable from those who could be regarded as normally functioning across the 10-year study interval. Thus the chronicity of psychopathology had the most pervasive effect on the level of maladaptation. Because our study was not intended to elucidate the underlying etiological mechanisms of the continuities and discontinuities of psychopathology, we do not know to what extent genetic or environmental factors are responsible for the chronicity of psychopathology and for its negative effects on so many domains of functioning.

Our findings emphasize the importance of obtaining the developmental history on an adult individual's emotional and behavioral problems in the assessment of psychopathology.

7 General Discussion

Chapter 7
General Discussion

The continuities and discontinuities of psychopathology from childhood into adulthood were tested in several ways. Not only did we make use of two different assessment approaches (i.e., the empirically based approach and the nosological approach of DSM), we also looked at different informants (i.e., parents as informant on their child's behavior, both in childhood and in adulthood, and subjects themselves as informant on their own behavior).

The Empirically Based Approach. The empirically based approach progresses "from the ground up", that is, it begins with standardized assessment of large samples of subjects and then uses multivariate analyses to derive patterns of co-occurring problems from the data (e.g., Achenbach, 1995). The syndromes provide a basis for describing individuals according to the problems that they manifest. The questionnaires that have been used in the present study across all assessment points were developed using this empirically based approach (e.g., Achenbach, 1991a).

Data obtained with these questionnaires were used in different ways. When looking at the stability of scores across time, stability coefficients were used to indicate whether subjects retained their ranking order across time. To evaluate the magnitude of stability coefficients Cohen's (1988) criteria were used: small (r = .10 to .29), medium (r = .30 to .49), or large ($r \geq .50$). Furthermore, to assess the course of individuals who score in the deviant range a categorical approach was applied. For this purpose, cutoff points based on scores obtained for normative samples of each sex and different ages were used, and subjects scoring above the cutoff were regarded as deviant.

The Nosological Approach of DSM. The nosological approach embodied in the Diagnostic and Statistical Manual (DSM) of the American Psychiatric Association, can be described as progressing "from the top down", that is, this approach starts with assumptions about the disorder that exist. This approach defines disorders as being either present or absent, based on present-versus-absent judgements of each criterial feature (Verhulst and Achenbach, 1995).

In the present study, DSM-IV disorders were obtained using a diagnostic interview. By adding this diagnostic interview, problems could be evaluated in terms of psychiatric disorders in adulthood.

Different Informants. Prior studies have shown that different informants (i.e., parents, subjects themselves) make different contributions to the prediction of psychopathology (Verhulst and Van der Ende, 1992a; Verhulst et al., 1997a), therefore different informants should be used when testing predictions of psychopathology.

In the present study, the following information was used: parental information on their child's behavior at time 1 (1983), and parent reported and self-reported information was obtained at follow-up. Furthermore, at time 3 (1987), time 4 (1989), and time 5 (1991) subjects were asked to fill out self-report questionnaires.

Continuity and Change from Childhood and Adolescence into Adulthood

We determined the continuity and change of behavioral and emotional problems from childhood (chapter 2) and adolescence (chapter 5) into adulthood: 1) assessed with comparable rating scales across the years, using the same informants (i.e., parents or subjects themselves), and different informants (i.e., parents at initial assessment, subjects themselves at follow-up), using continuous scores and proportions of subjects classified as scoring in the deviant or in the borderline range of scores obtained for normative samples, and 2) assessed with rating scales at initial assessment and a psychiatric interview (CIDI) at follow-up.

Stability and Change of Continuous Rating Scales. The mean stability coefficient between parent reported Total Problem scores at initial assessment and those obtained 14 years later was .43, which is medium according to Cohen's criteria (chapter 2). The stability across informants from parents' to self-report scores was somewhat lower (mean r = .22). When looking at stability coefficients between self-reported scores at time 3 and those obtained 10 years later (time 6), the mean stability coefficient for the Total Problem score was medium (mean r = .42) (chapter 5). When looking more specifically (i.e., at syndrome scales), most intrainformant 14-year (parent reported) and 10-year (self-reported) stabilities were medium. The 14-year cross-informant stabilities were, in general, small.

The lower predictability of cross-informant versus intrainformant scores found in all our analyses, can be attributed to the use of different informants (parents at time 1 versus self-report at follow-up). In a meta-analysis Achenbach et al. (1987) found that the mean correlation between problem scores derived concurrently from parents and subjects themselves was .25. We found correlations between parent reported and self-reported scale scores at time 6 ranging from .28 to .48. Thus, given the different types of informant and the long time interval, it was remarkable that time 1 parent reported scores significantly predicted time 6 self-reported scores.

Continuity and Change Using Categories Based on Rating Scale Scores. When the course of problem behavior of individuals was determined, using a categorical approach, we found that 41% of the subjects who obtained parent reported Total Problem scores in the deviant range at initial assessment (time 1, 1983) also obtained parent reported Total Problem scores in the deviant range at follow-up (time 6, 1997), while 29% obtained self-reported Total Problem scores in the deviant range at follow-up (chapter 2). The percentage of subjects who obtained self-reported Total Problem scores both at time 3 (1987) and at follow-up 10 years later was 22 (chapter 5).

Although a substantial proportion of the initially deviant subjects seemed to recover, at follow-up still 65% according to self-report information and 78% according to parental information, obtained scores above the 50th percentile of the Total Problem score frequency distribution, indicating that the level of problems did decrease across the years, but that a return to 'normal' was not very likely.

Continuity and Change Using DSM Diagnostic Categories as Outcome. In chapters 3 and 5, the prediction of adult psychopathology classified following the nosological approach of DSM (i.e., DSM-IV) from childhood (chapter 3) and adolescence (chapter 5) problems was determined. When looking at the predictive value of parent reported (chapter 3) and self-reported (chapter 5) behavioral and emotional problems for later DSM-IV disorders, we found that children and adolescents with high levels of behavioral and emotional problems were more likely to meet criteria for DSM-IV diagnoses in adulthood than children and adolescents who were considered normal.

Multifinality and Equifinality

When looking at the continuity into adulthood from time 1, when parent reports were obtained, and from time 3, when self-reports were obtained to determine the pathways of psychopathology from childhood and adolescence into adulthood, both homotypical continuity (i.e., internalizing behaviors predicted internalizing behaviors) and heterotypical continuity (i.e., internalizing behaviors predicted externalizing behaviors as well) were found.

In addition, our findings illustrated the constructs of multifinality (i.e., dispersion of outcomes) and equifinality (i.e., diversity of pathways may lead to common outcomes) as described by Cicchetti (1990). Most time 6 syndromes were predicted by more than one time 1 syndrome, and for instance the internalizing scale Withdrawn was predictive of both internalizing and externalizing behaviors in adulthood. The same held true for self-reported problems from adolescence into adulthood (chapter 5). When DSM-IV disorders were the outcome in adulthood, the constructs of multifinality and equifinality were applicable as well (chapters 3 and 5).

Important Predictors

For intervention and prevention purposes it is of importance to know which behaviors are especially important as predictor for later psychopathology. Parent reported withdrawal and social problems appeared to be especially important predictors of adult psychopathology across a 14-year follow-up. Although no direct equivalent DSM-IV Axis I category exists, the results as described in chapter 2 underscore these problems as important foci for intervention and prevention strategies. In addition, self-reported social problems, as described in chapter 5, were found to be protective of later delinquent behavior in females. It may be that girls who do not get along with peers, who get teased, or who are not liked by peers, are less likely to engage in deviant peer relationships. Longitudinal studies have shown that deviant peer relationships play an independent role in both the initiation (Keenan et al., 1995) and the continuity (Fergusson and Horwood, 1996) of delinquency in adolescence.

When DSM-IV disorders as outcomes in adulthood were the focus, our results showed a relatively strong link between parent reported oppositional behaviors in

childhood and later disruptive disorders, in both males and females (chapter 3). When looking at self-reported behavioral problems, this link was only found for males (chapter 5).

Whereas in earlier studies, pertaining to the continuity of psychopathology from childhood into adolescence, externalizing behaviors were found to be better predictors of psychopathology than internalizing behaviors (e.g., Offord et al., 1992), the results from chapters 2 and 5 showed that neither parent reported nor self-reported externalizing behaviors did surpass internalizing behaviors in their ability to predict adult psychopathology, stressing the relevance of both externalizing and internalizing behavior. Internalizing problems should not be disregarded because they are not more likely to disappear across time than externalizing problems.

Impact of Different Courses from Adolescence into Adulthood

To determine the effect of different pathways of behavioral and emotional problems from adolescence into adulthood on outcome in adulthood, we selected four groups of individuals on the basis of their developmental trajectories in chapter 6: "persisters" (individuals who could be regarded deviant at each of the four assessments); "decreasers" (individuals who showed high levels of problems in adolescence but returned to normal in adulthood); "increasers" (individuals who showed high levels in adulthood but not in adolescence), and "normals" (individuals who had low levels of problems at each of the four assessments).

We found that subjects who persistently showed high levels of psychopathology from adolescence into adulthood seemed to be captured in a trajectory towards a broad range of signs of maladaptation in adulthood, and seemed to be more vulnerable than those whose psychopathology emerged de novo during a later phase in their development towards adulthood. This fits well in the theoretical framework stating that the more persistent a deviant pathway is followed, the more difficult it is to reclaim a normal developmental trajectory (e.g., Cicchetti and Cohen, 1995; Sroufe, 1989). In contrast, individuals who showed psychopathology at earlier assessments during adolescence but who reclaimed a normal developmental pathway were nearly indistinguishable from those who could be regarded as normally functioning across the 10-year study interval. Thus the chronicity of psychopathology had the most pervasive effect on the level of maladaptation.

Prediction of Poor Outcome and Social Impairment

To determine the broader consequences of psychopathology in childhood, information on poor outcome and social functioning later in life is of importance, in addition to the assessment of psychopathology. In chapter 4, we determined the predictive value of parent reported behavioral and emotional problems for poor outcome events and social impairment in adulthood. We found that children with high levels of parent reported problems were at risk for a number of poor outcome events, and for social impairment in adulthood. Externalizing behaviors (i.e., delinquent behavior in males, and aggressive behavior in females) were predictors of general poor outcome, stressing the strong continuity of externalizing problems. The finding that aggressive behavior was an important predictor for females is especially important because many studies pertaining to externalizing behaviors and its consequences include only boys.

As expected, a one-to-one association between impaired social functioning and psychopathology was lacking in the present study. Of all individuals who were impaired on one or more scales of the Groningen Questionnaire about Social Behavior (GQSB; Van der Lubbe, 1995), 25% scored in the deviant range on the YASR. Thus, a substantial group of individuals with impaired social functioning could not be regarded as showing psychopathology. This finding emphasizes the importance of impaired social functioning as outcome measure in addition to the assessment of psychopathology. In addition, our findings showed that having experienced problems during childhood creates a risk for social impairment in adulthood, partly independent of psychopathology, which in turn may render the individual susceptible to later problems.

Furthermore, parent reported withdrawal appeared to be an especially important predictor of social impairment in adulthood. Withdrawal from social interactions may preclude children from the interactive give-and-take necessary for the development of a 'normal' approach to interpersonal problem solving (Stewart and Rubin, 1995). Moreover, it may preclude children from taking advantage of the benefits of peer interchange (Rubin and Stewart, 1996). Our findings underline the impact of withdrawal during childhood on social functioning in adulthood.

Age and Sex Differences

Age was an important factor in the continuity of psychopathology across 14-years. As described in chapter 2, it was found that several stability coefficients were significantly higher for subjects who were adolescents (12-16 years) at initial assessment (time 1, 1983), than for subjects who were younger (4-11 years). This relation was most striking for females. Thus, subjects who were children at time 1, and who still had to pass through adolescence, showed less stability of problem behaviors than subjects who were adolescents at initial assessment. This finding indicates that occurrence of some types of problems in adolescents are less likely to disappear, compared to problems in younger children.

However, when looking at the 10-year prediction of psychopathology as reported by subjects themselves, as described in chapter 5, it was found that older subjects were less likely to obtain high scores on externalizing scales at follow-up. This finding is in agreement with prior studies, which reported that the level of antisocial activities drops in adult life (Cohen et al., 1993b; Robins et al., 1991).

Regarding the prediction of parent reported problems, self-reported problems, DSM-IV disorders, poor outcome events, and social impairment; a different picture emerged for males versus females. When high levels of general psychopathology were present in girls, they were more likely to display a broad range of psychopathology in adulthood than when this was the case in boys (chapters 3 and 5). For adult males we found that depression seemed to have roots in childhood problems, whereas depression in females was not linked with childhood problem behaviors and seemed to emerge de novo at a later stage in life (chapter 3). Alcohol abuse was preceded by aggressive behavior in females, whereas alcohol abuse/dependence in males tended to emerge de novo without earlier signs of psychopathology (chapter 5). In the diverse associations between behavioral and emotional problems in childhood and poor outcome variables in adulthood, 14 years later, sex differences were found as well (chapter 4). For instance, the Delinquent Behavior scale predicted arrest in males but not in females, and the Externalizing scale predicted suicide attempt and other self-harm in females but not in males.

Although the sex differences found in the present study argue against basing assumptions concerning etiology or treatment on findings from one sex, the sample

size did not allow for testing of the sex differences by computing interactions in the prediction of the outcome variable in the entire sample.

Important Negative Findings

In the present study, some negative findings, which are of importance emerged. The fact that no (or hardly any) associations for certain childhood problems with later problems were found, or that some adult problems were not preceded by earlier difficulties can be very informative, and therefore needs attention.

Attention Problems. Most outcome studies of children with Attention Deficit/Hyperactivity Disorder (ADHD) came to the conclusion that these children have a poor outcome (for review, see Taylor, 1999). These studies often involved clinically referred children who often have a multitude of problems besides ADHD. In some studies, but not all, did the authors adjust for confounding factors. Moreover, most studies that determined the outcome of childhood ADHD did not extend their follow-up beyond adolescence.

In our study, the CBCL Attention Problems scale, including items such as can't concentrate, can't sit still, impulsive, and clumsy, did not predict any of the DSM-IV categories, when adjusted for the associations with the other CBCL scales across the 14 year follow-up interval (chapter 3). This scale did predict referral to mental health services in adult males (only in the univariate analyses), but no other signs of poor outcome (chapter 4). Regarding self-reported attention problems (i.e., the YSR scale Attention Problems), this scale was found to be of only small predictive value for later Attention Problems in females but not in males and of no predictive value for later Aggressive Behavior, Delinquent Behavior, or Intrusive Behavior after adjusting for the associations with the other YSR scales, across the 10-year follow-up (chapter 5).

These findings are supported by Fergusson et al. (1997) who reported that attention problems at age 8 were unrelated to juvenile offending or substance abuse at age 18 after adjustment for confounding factors such as early conduct problems. However, attention problems were related to later poor academic success even after adjustment for confounding factors. This last finding was not confirmed in the present study, most likely because we assessed academic success in a more stringent way.

Mood Disorders. Although the prevalence of mood disorders among males in adulthood was much less than among females, mood disorders were associated with childhood problems only in males (chapter 3). This suggests that the developmental pathways towards the rarer mood disorders in adult males tends to be rooted in earlier problems during childhood, whereas the much more prevalent mood disorders in adult females tend to emerge de novo later in life.

The gender difference in prevalence of DSM-IV mood disorders in our sample of 18- to 30-year-olds at follow-up is consistent with that found in other studies, although the female: male ratio of 4:1 in our study exceeds the ratio for 12-month risk of DSM-III-R affective disorders of 1.7:1 found in the National Comorbidity survey in which 15- to 54-year-olds were assessed with the CIDI (Kessler et al., 1994).

The female preponderance of mood disorders is not present in prepubertal children. Cyranowski et al. (2000) provide a theoretical framework to explain this gender gap in depression which emerges somewhere in adolescence. They emphasize the depressogenic diathesis which makes females more than males prone to become depressed when faced with negative life events, especially life events with interpersonal consequences.

In addition to the possible role of adolescence/young adulthood as the developmental period in which female depression emerges, our findings emphasize the role of childhood origins of depression in males.

Limitations of the Study

The main limitation of the current study, shared with other longitudinal studies, is the generalizability of findings, despite the fact that we traced around 80% of the time 1 sample, and that our data did not suggest selective attrition. A related limitation is the sample size of approximately 1,600 subjects from the general population, which is too small to examine developmental pathways toward specific diagnoses or relatively rare disorders such as schizophrenia or bipolar disorder, or to examine the further development of very rare childhood disorders such as autism.

Furthermore, historical aspects were not taken into account. The period, in which the subjects grew up, might have influenced the rates of psychopathology. Because we did not include standardized information on treatment and help seeking during

the years of follow-up, we could examine the impact of treatment on the course of problem behavior from childhood into adulthood. Moreover, possible gender and age differences might have occurred in help-seeking behavior as well, and consequently, gender and age differences in receiving treatment may have influenced the outcome selectively. Finally, the design of the present study did not allow us to take the influences of etiological, genetic, and environmental factors into account. Moreover, the study was not designed to identify factors that may explain the underlying mechanisms of why some individuals remained problematic, while others seemed to improve.

Clinical and Research Implications

Our study provides several important clinical and research implications:

1. the findings showed that even across a long follow-up of 10- to 14-years, and across several transition periods, the continuity of behavioral and emotional problems from childhood and adolescence into adulthood was substantial. Even when information was used from parents at initial assessment (time 1, 1983), and from subjects themselves at follow-up (time 6, 1997), significant continuity was found;
2. by using a diagnostic interview at follow-up, DSM-IV disorders could be used as outcome measure. The fact that both children and adolescents with high initial levels of behavioral and emotional problems were more likely to meet criteria for DSM-IV diagnoses at follow-up, than children and adolescents who could be considered as normal, argue against a wait-and-see policy for children and adolescents with high levels of behavioral and emotional problems, and emphasize the importance of intervention strategies in childhood and adolescence for the prevention of continuity of behavioral and emotional problems into adulthood;
3. the findings of the present study demonstrated that parents can be considered valuable informants on the behavior of their (young) adult children. The use of multiple informants in assessing psychopathology has already become general practice in child and adolescent psychiatry; in adult psychiatry more attention could be given to parents as additional informants as well;

4. in several cases, both withdrawal and social problems were found to be important predictors of psychopathology, poor outcome, or social functioning in adulthood. The present study underscores these problems as an important focus for intervention, although no direct equivalent DSM-IV (American Psychiatric Association, 1994) Axis I categories exist. However, our findings emphasize the importance of the use of DSM-IV Axis V, in which social problems are represented, for predicting behavioral outcomes;
5. the finding that attention problems were not associated with adult psychopathology (as assessed using DSM-IV criteria) or poor outcome is important because it supports findings reported in other studies of unselected samples, and suggests that later psychopathology is not so much the direct effect of the attentional difficulties but the effect of psychopathology associated with attentional problems such as oppositional behaviors (as was found for males). Our findings suggest that, in terms of long term outcome, it is more important to focus on associated psychopathology than on attentional problems per se;
6. externalizing problems in girls were found to be important risk factors for later difficulties, such as suicide attempts and other self-harm, general poor outcome, and alcohol abuse in adulthood. Many prior studies pertaining to externalizing behaviors were limited to boys; our findings emphasize the importance of attention for these kind of behaviors when present in girls;
7. the present study showed that when psychopathology was chronic from adolescence into adulthood, the consequences for overall adaptive functioning reached beyond the mere level of psychopathology and extended to a broad range of maladaptive functioning. Compared to those whose psychopathology emerged de novo in young adulthood or adulthood, individuals in our sample whose deviance was chronic did much worse on most measures of adaptive functioning. In contrast, individuals who showed psychopathology at earlier assessments during adolescence but who reclaimed a normal developmental pathway were nearly indistinguishable from those who could be regarded as normally functioning across the 10-year study interval. Thus, the chronicity of psychopathology had the most pervasive effect on the level of maladaptation. These findings emphasize the importance of obtaining the developmental

history of an adult individual's emotional and behavioral problems in the assessment of psychopathology;

8. it is important to take account of sex differences when looking at psychopathology across the life-span, because the pathways and predictive values for males and females, as found in the present study, seemed to differ. One should bear in mind that males and females differ, not only biologically, but psychologically as well. Therefore, studies investigating continuity and change of psychopathology, poor outcome events, and social impairment in adulthood ought to take account of the possible differences for males versus females.

Future Research

The ideal study design for investigating continuities and discontinuities of psychopathology from childhood into adulthood would be a longitudinal design, using a very large sample of both males and females. Psychopathology should be assessed both using the empirically based approach and the nosological approach of DSM, using comparable instruments across assessment points, and obtaining information from several informants. In addition to psychopathology, variables that might explain the underlying mechanisms of continuity and change, such as genetic and environmental influences, help-seeking behavior, and treatment, should be assessed. At each assessment point, poor outcome variables and social impairment, should be assessed as well.

This ideal study design would not be hampered by the limitations the present study was hampered by. Unfortunately, a longitudinal study takes many years to be accomplished, and variables may emerge that influence continuity and change, which were not assessed initially. Statistical analyses using accelerating methods may be the answer to many of the current problems (for an example of an accelerated longitudinal study, see Stanger et al., 1994).

In the present study, which was aimed at the continuity and change of psychopathology in a general population sample, several pathways from childhood and adolescence into adulthood were demonstrated. Future studies could focus on these pathways and study factors explaining the persistence of the particular types of problem behavior.

Conclusions

The present study was part of an ongoing longitudinal study on the continuity and change of psychopathology from childhood into adulthood, encompassing 6 assessment points. Evidence was found for substantial continuity from both parent reported and self-reported childhood behavioral and emotional problems into adulthood. Moreover, children and adolescents with high levels of behavioral and emotional problems were more likely to meet criteria for DSM-IV diagnoses in adulthood than children and adolescents who could be considered as normal.

In addition, we found that the chronicity of psychopathology from adolescence into adulthood had the most pervasive effect on the level of maladaptation in adulthood.

Considering our results, it appears very important to attempt early prevention and adequate early intervention, before the child's or adolescent's behavior has become chronic and accordingly will be less susceptible to improvement.

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Summary

Summary

The primary objective of the present study was to examine the longitudinal course of psychopathology across a broad age range. In **chapter 1**, the background and the main aims of the current study were presented, these aims were: (1) to determine the continuity and change of psychopathology from childhood into adulthood taking sex and age into account, and to investigate the predictive value of psychopathology in childhood and adolescence for later psychopathology, as assessed with a parent rating scale, a self-report rating scale, and a diagnostic interview; (2) to determine the effects of various longitudinal pathways of psychopathology on adult functioning; and (3) to determine the predictive value of psychopathology in childhood and adolescence for poor outcome events and signs of impaired social functioning in adulthood.

In **chapter 2**, the 14-year continuity and change of behavioral and emotional problems from childhood into adulthood were tested. For 1,615 children and adolescents aged 4 to 16 years from the general population, parents completed the Child Behavior Checklist (CBCL) at initial assessment. At follow-up 14 years later, subjects completed the Young Adult Self-Report (YASR), and their parents completed the Young Adult Behavior Checklist (YABCL).

Of the subjects who were initially classified as deviant, 14 years later 41% were classified as deviant (i.e., score > 82nd percentile) according to their YABCL Total Problem score, and 29% according to their YASR Total Problem score. Furthermore, subjects who were adolescents at initial assessment (12-16 years) showed higher stability of problem behaviors than subjects who were children at initial assessment (4-11 years). Parent-reported withdrawal and social problems appeared to be especially important predictors of adult malfunctioning. Our study underscored these problems as an important focus for intervention, although no direct equivalent DSM-IV Axis I categories exist. Our findings underscore the importance of the use of DSM-IV Axis V, in which social problems are represented, for predicting behavioral outcomes.

In **chapter 3**, the adult outcome of childhood psychopathology was determined using a diagnostic interview. For 1,578 4- to 16-year-olds parent ratings of behavioral and emotional problems were obtained in 1983. At follow-up, 14 years

later, subjects were reassessed with a standardized DSM-IV interview. We found that high levels of childhood problems predicted an approximate 2- to 6-fold increased risk for adulthood DSM-IV diagnoses. Furthermore, the associations between specific childhood problems and adulthood diagnoses were complex, with both homotypic and heterotypic continuities. The strongest predictors of disorders in adulthood were childhood oppositional behaviors. In contrast, Attention Problems did not predict any of the DSM-IV categories when adjusted for the associations with other CBCL scales.

In **chapter 4**, the predictive value of parent reported childhood problem behaviors for poor outcome and impaired social functioning in adults was determined, because it is important to determine the broader consequences of child psychopathology for adult functioning, in addition to information about the continuity and discontinuity of psychopathology. Parents' ratings obtained via the Child Behavior Checklist (CBCL) were used to predict poor outcome events, such as referral to mental health services, arrest by the police, and alcohol abuse, and signs of impaired social functioning in adulthood. Significant odds ratios ranging from 1.7 to 6.1, for associations between CBCL scales and referral, suicide attempts and other self-harm, arrest, expulsion from school or job, no formal education beyond elementary school, and alcohol abuse in adulthood were found. A wide range of parent reported problems in childhood predicted impairment in social functioning. The CBCL scale Withdrawn was found to be the most frequent predictor of impaired social functioning. Thus, childhood psychopathology creates a risk for maladjustment in adulthood, partly independent of psychopathology.

In **chapter 5**, the 10-year course and predictive value of self-reported problems in adolescence in relation to psychopathology in adulthood was investigated. Subjects, aged 11 to 19 years, were assessed with the Youth Self-Report (YSR) at initial assessment, and with the Young Adult Self-Report (YASR) 10 years later. A diagnostic interview, the Composite Diagnostic Interview Schedule (CIDI) and three sections of the Diagnostic Interview Schedule (DIS) for deriving DSM-IV diagnoses were included at follow-up as well. Of the subjects with YSR Total Problem scores in the deviant range (i.e., score > 90th percentile), 23% (males) and 22% (females) had YASR Total Problem scores in the deviant range at follow-up. Subjects with initial YSR Total Problem, Internalizing, and Externalizing scores in the deviant

range had higher prevalences of DSM-IV diagnoses at follow-up. Associations between adolescent and adulthood psychopathology were different for males versus females. Thus, adolescent problems tended to persist into adulthood to a moderate degree. High rates of problems during adolescence are risk factors for psychiatric disorders in adulthood. Sex differences in continuities from adolescence into adulthood argue against basing assumptions concerning the etiology or treatment about both sexes on findings from one sex.

In **chapter 6**, we determined the impact of contrasting developmental pathways of psychopathology on adult outcome. A total sample of 705 individuals from ages 11-19 years to ages 21-29 years were assessed at four assessment points (1987, 1989, 1991, and 1997). Self-reports were obtained, using the Youth Self-Report (YSR) and the Young-Adult Self-Report (YASR). In addition, DSM-IV diagnoses, information pertaining to signs of maladjustment, and measures of social functioning were obtained at follow-up. Four contrasting pathways of psychopathology were selected on the basis of the self-report ratings over four assessments: "persisters", "decreasers", "increasers", and "normals". We found that subjects whose overall level of psychopathology persisted over time obtained more 12-months and lifetime DSM-IV diagnoses, and had a poorer general outcome in adulthood compared to subjects whose level of psychopathology increased across time. Subjects, who followed a pathway that returned to normal after high levels of problems in adolescence, were only slightly different in terms of outcome from subjects who always scored normal. The findings emphasize the importance of a subject's history of emotional and behavioral problems in the assessment of problems in adulthood. The findings support the theoretical framework stating that the longer an individual continues along a maladaptive pathway, the more difficult it is to reclaim a normal developmental trajectory.

In **chapter 7**, the main findings and conclusions of the present study were summarized and discussed. In the present study, evidence was found for substantial continuity from both parent reported and self-reported behavioral and emotional problems into adulthood. Moreover, children and adolescents with high levels of behavioral and emotional problems were more likely to meet criteria for DSM-IV diagnoses in adulthood than children and adolescents who could be considered as

normal. In addition, it was found that a chronic pathway of psychopathology from adolescence into adulthood had a strong impact on outcome in adulthood.

Considering our results, it appears very important to attempt early prevention and adequate early intervention, before the child's or adolescent's behavior has become chronic and accordingly will be less susceptible to improvement.

Samenvatting

Samenvatting

De belangrijkste doelstelling van de huidige onderzoek was het vaststellen van het longitudinale beloop van psychopathologie van kindertijd/adolescentie tot in de volwassenheid. In **hoofdstuk 1** werden de onderzoeksdoelen gepresenteerd: (1) het bepalen van stabiliteit en verandering van psychopathologie van kindertijd/ adolescentie naar volwassenheid, rekening houdend met geslacht en leeftijd, en het onderzoeken van de voorspellende waarde van psychopathologie in de kindertijd en adolescentie voor latere psychopathologie, zoals gemeten met een oudervragenlijst, een zelf-rapportage lijst, en een gestructureerd psychiatrisch diagnostisch interview; (2) het bepalen van de effecten van verschillende longitudinale paden van psychopathologie op volwassen functioneren; en (3) het bepalen van de voorspellende waarde van psychopatholgie in de kindertijd en adolescentie van tekenen van disfunctioneren waaronder beperkt sociaal functioneren in volwassenheid.

In **hoofdstuk 2** werd de 14-jarige stabiliteit en verandering van gedragsproblemen en emotionele problemen van kindertijd/adolescentie naar volwassenheid getoetst. Ouders van 1.615 kinderen en adolescenten in de leeftijd van 4 tot 16 jaar uit de algemene bevolking vulden de Child Behavior Checklist (CBCL) in, op het eerste meetmoment. Tijdens follow-up 14 jaar later, vulden personen de Young Adult Self-Report (YASR) in, en hun ouders de Young Adult Behavior Checklist (YABCL).

Van de personen die aanvankelijk werden geclassificeerd als afwijkend (i.e., een score boven de 82^{e} percentiel), was 41%, wanneer er werd gekeken naar hun YABCL Totale Probleemscore, en 29%, wanneer er werd gekeken naar hun YASR Totale Probleemscore, 14 jaar later nog steeds afwijkend. Bovendien, vertoonden personen die adolescent waren op het eerste meetmoment (12-16 jaar) een hogere stabiliteit van probleemgedrag dan personen die kinderen waren op het eerste meetmoment (4-11 jaar). Door ouders gerapporteerd teruggetrokken gedrag en sociale problemen bleken belangrijke voorspellers van onaangepast gedrag in volwassenheid. Ons onderzoek benadrukte deze problemen als een belangrijk onderwerp voor interventie, ook al bestaan er geen direct gelijkwaardige DSM-IV As I categoriën. Onze bevindingen benadrukken het belang van het gebruik van de

DSM-IV As V, waarin sociale problemen zijn vertegenwoordigd, voor de voorspelling van gedragsuitkomsten.

In **hoofdstuk 3** werd de uitkomst van psychopathologie in de kindertijd/ adolescentie bepaald gebruik makend van een diagnostisch interview. Voor 1,578 4- tot 16-jarigen werd in 1983 door ouders gerapporteerde informatie met betrekking tot gedragsproblemen en emotionele problemen verzameld. Tijdens follow-up, 14 jaar later, werden proefpersonen herbeoordeeld met behulp van een gestandaardiseerd DSM-IV interview. We vonden dat hoge niveaus van problemen in de kindertijd een verhoogd risico voor DSM-IV diagnoses in volwassenheid van ongeveer 2- tot 6-maal voorspelden. Bovendien waren de associatie tussen specifieke problemen op de kinderleeftijd en diagnoses op volwassen leeftijd complex, met zowel homotypische als heterotypische continuïteit. De sterkste voorpellers van afwijkingen in volwassenheid waren oppositionele problemen in de kindertijd/adolescentie. Hier tegenover staat dat de CBCL schaal Aandachts-problemen geen enkele DSM-IV categorie voorspelde, rekening houdend met associaties met andere CBCL schalen op T1.

In **hoofdstuk 4** werd de voorspellende waarde van door ouders gerapporteerd probleemgedrag in de kindertijd/adolescentie voor tekenen van disfunctioneren en beperkt sociaal functioneren bij volwassenen bepaald omdat het belangrijk is om de bredere consequenties van psychopathologie in de kindertijd voor volwassen functioneren te bepalen, in aanvulling op informatie over de stabiliteit en verandering van psychopathologie. Scores verkregen van ouders via de Child Behavior Checklist (CBCL) werden gebruikt om tekenen van disfunctioneren, zoals verwijzing naar de GGZ, arrestatie, en alcoholmisbruik, en beperkt sociaal functioneren te voorspellen. Significante odds ratios met een bereik van 1,7 tot 6,1 voor associaties tussen CBCL schalen en verwijzing naar de GGZ, zelfmoord-pogingen en ander zelf-destructief gedrag, arrestatie, verwijdering van school of ontslag, geen opleiding na de lagere school, en alcoholmisbruik werden gevonden. Een brede range van door ouders gerapporteerde problemen in de kindertijd/ adolescentie voorspelde beperkingen in het sociaal funtioneren. Dus, psycho-pathologie in de kindertijd/adolescentie veroorzaakt een risico voor onaangepastheid in volwassenheid, gedeeltelijk onafhankelijk van psycho-pathologie op volwassen leeftijd.

In **hoofdstuk 5** werd het 10-jaars beloop en de voorspellende waarde van zelf-gerapporteerde problemen in de adolescentie in relatie tot psychopathologie in volwassenheid onderzocht. Personen in de leeftijd van 11 tot 19 jaar werden beoordeeld met behulp van de Youth Self-Report (YSR) op het eerste meetmoment, en met de Young Adult Self-Report (YASR) 10 jaar later. Een diagnostisch interview, de Composite Diagnostic Interview Schedule (CIDI) en drie secties van de Diagnostic Interview Schedule (DIS) voor het verkrijgen van DSM-IV diagnoses werd ook afgenomen van alle personen tijdens follow-up. Van de personen met YSR Totale Probleemscores in de deviante range (i.e., een score boven de 90^{e} percentiel) had 23% (mannen) en 22% (vrouwen) YASR Totale Probleemscores in de deviante range tijdens follow-up. Personen met aanvankelijk YSR Totale Probleemscores, Internaliserende, en Externaliserende scores in de deviante range vertoonden hogere prevalenties van DSM-IV diagnoses bij follow-up. Associaties tussen psycho-pathologie in de adolescentie en psychopathologie in volwassenheid waren verschillend voor mannen versus vrouwen. Dus, problemen in de adolescentie hadden de neiging naar volwassenheid te persisteren. Hoge niveaus van problemen gedurende de adolescentie was een risico factor voor psychiatrische stoornissen op de volwassen leeftijd. Geslachtsverschillen voor de stabiliteiten van psycho-pathologie van adolescentie naar volwassenheid pleiten tegen het baseren van assumpties ten aanzien van etiologie of behandeling voor beide geslachten op bevindingen bij één geslacht.

In **hoofdstuk 6** bepaalden we de invloed van contrasterende ontwikkelingspaden van psychopathologie op de uitkomst in volwassenheid. Een complete groep van 705 individuen van de leeftijd van 11-19 jaar tot de leeftijd van 21-29 jaar werd beoordeeld op vier meetmomenten (1987, 1989, 1991, en 1997). Zelf-rapportage werd verkregen met behulp van de Youth Self-Report (YSR) en de Young Adult Self-Report (YASR). In aanvulling hierop werden DSM-IV diagnoses, informatie over tekenen van disfunctioneren, en metingen van sociaal functioneren verkregen tijdens follow-up. Vier contrasterende paden van psychopathologie werden geselecteerd op basis van de zelf-rapportage op de vier meetmomenten: "persisters" (i.e., personen wiens algehele niveau van psychopathologie bij alle vier de meetmomenten hoog was), "decreasers" (i.e., personen wiens niveau van psycho-pathologie bij eerste meting hoog was en in loop der tijd is afgenomen), 'increasers"

(i.e., personen wiens niveau van psychopathologie bij eerste meting laag was en in loop der tijd is toegenomen), en "normals" (i.e., personen wiens algehele niveau van psychopathologie bij alle vier de meetmomenten normaal was). We vonden dat personen wiens algehele niveau van psychopathologie bij alle vier de meetmomenten hoog was, aan meer 12-maanden en "lifetime" DSM-IV diagnoses voldeden, en dat zij een slechtere algemene uitkomst in volwassenheid hadden, dan personen wiens niveau van psychopathologie bij eerste meting laag was en in loop der tijd toegenomen. Personen die een pad volgden dat, na een hoog niveau van problemen in de adolescentie, terugkeerde naar normaal bleken slechts gering te verschillen met betrekking tot uitkomst, dan personen die altijd normaal functioneerden. De bevindingen benadrukken het belang van de voorgeschiedenis van gedragsproblemen en emotionele problemen bij de beoordeling van problemen in volwassenheid. De bevindingen ondersteunen het theoretische kader dat stelt dat hoe langer een individu een ontwikkelingspad van onaangepastheid volgt, des te moeilijker het zal zijn om naar een normaal ontwikkelingstraject terug te keren.

In **hoofdstuk 7** werden de belangrijkste bevindingen en conclusies van het huidige onderzoek samengevat en besproken. In het huidige onderzoek werd een substantiele stabiliteit naar volwassenheid van zowel door ouders gerapporteerde als door personen zelf gerapporteerde gedragsproblemen en emotionele problemen in de kindertijd/adolescentie gevonden. Bovendien was het waarschijnlijker dat kinderen en adolescenten met hoge niveaus van gedragsproblemen en emotionele problemen voldeden aan criteria voor DSM-IV diagnoses in volwassenheid dan kinderen en adolescenten die als normaal beschouwd konden worden bij aanvang van het onderzoek. Verder werd gevonden dat een chronisch beloop van psychopathologie van adolescentie naar volwassenheid een grote invloed had op de uitkomst in volwassenheid.

Onze bevindingen onderstrepen het belang van vroege preventie en interventie, voordat het gedrag van het kind of de adolescent chronisch is geworden en daardoor minder ontvankelijk voor verbetering.

Dankwoord
Curriculum Vitae

Dankwoord

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Curriculum Vitae

Marijke Birgitta Hofstra werd geboren op 31 december 1970 te Västerås, Zweden. In 1989 behaalde zij het V.W.O.-diploma aan het Stedelijk Lyceum te Zutphen. In hetzelfde jaar begon zij met de studie Geneeskunde aan de Erasmus Universiteit Rotterdam, waar het doctoraal werd behaald in juli 1994. Tijdens haar studie deed zij gedurende een half jaar onderzoek naar ademhalingsproblemen bij (te) vroeg-geboren kinderen op de afdeling Neonatologie van het Karolinska Sjukhuset te Stockholm, Zweden (hoofd: Prof. dr H. Lagercrantz).

In juli 1996 behaalde zij haar artsexamen en vanaf augustus 1996 tot en met augustus 2000 was zij als assistent in opleiding (AIO), verbonden aan de afdeling kinder- en jeugdpsychiatrie van het Academisch Ziekenhuis Rotterdam-Sophia / Erasmus Universiteit Rotterdam (hoofd: Prof. dr F.C. Verhulst). In deze periode werd de zesde meting van een longitudinaal onderzoek naar de continuïteit en predictieve waarde van psychopathologie van de kindertijd naar volwassenheid in een algemene bevolkingspopulatie uitgevoerd, waarvan de resultaten in dit proefschrift beschreven zijn.

Sinds september 2000 is zij werkzaam als arts-assistent niet in opleiding (AGNIO) op de afdeling neurologie van het Academisch Ziekenhuis Rotterdam-Dijkzigt (hoofd: Prof. dr van der Meché), en in juli 2001 zal haar opleiding tot psychiater op de afdeling psychiatrie van het Academisch Ziekenhuis Rotterdam-Dijkzigt beginnen.