

Developmental course of psychopathology in youths with and without intellectual disabilities

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Background: We aimed to describe similarities and differences in the developmental course of psychopathology between children with and without intellectual disabilities (ID). **Methods:** Multilevel growth curve analysis was used to analyse the developmental course of psychopathology, using the Child Behavior Checklist (CBCL), in two longitudinal multiple-birth-cohort samples of 6- to 18-year-old children with ID ($N = 978$) and without ID ($N = 2,047$) using three repeated measurements across a 6-year period. **Results:** Children with ID showed a higher level of problem behaviours across all ages compared to children without ID. A significant difference between the samples in the developmental courses was found for Aggressive Behaviour and Attention Problems, where children with ID showed a significantly larger decrease. Gender differences in the development of psychopathology were similar in both samples, except for Social Problems where males with ID showed a larger decrease in problem behaviour across time than females with ID and males and females without ID. **Conclusions:** Results indicate that children with ID continue to show a greater risk for psychopathology compared to typically developing children, although this higher risk is less pronounced at age 18 than it is at age 6 for Aggressive Behaviour. Contrary to our expectations, the developmental course of psychopathology in children with ID was quite similar from age 6 to 18 compared to children without ID. The normative developmental trajectories of psychopathology in children with ID, presented here, can serve as a yardstick against which development of childhood psychopathology can be detected as deviant. **Keywords:** Intellectual disability, behaviour problems, development, longitudinal studies. **Abbreviations:** CBCL: Child Behavior Checklist; GP: general population; ID: intellectual disabilities; SES: socio-economic status.

Both pioneering (Corbett, 1985; Rutter, Tizard, & Whitmore, 1970) and recent (Dekker, Koot, van der Ende, & Verhulst, 2002; Dykens, 2000; Emerson, 2003) studies showed a 3–7 times higher prevalence of emotional and behavioural problems in children and adolescents with intellectual disabilities (ID), compared with typically developing youths. Whether the developmental course of psychopathology is similar, despite elevated levels in children with ID compared to typically developing youths, remains unanswered.

Traditionally, the developmental course of psychopathology is reported by stability, persistence and remission (e.g., Richardson, Koller, & Katz, 1985; Tonge & Einfeld, 2003). Few studies have investigated changes in the level of psychopathology in children with ID, showing a decrease of overall level of problem behaviours over time, despite high levels of stability and persistence (McCarthy & Boyd, 2001; Richardson et al., 1985; Wallander, Dekker, & Koot, 2003). In a recent longitudinal study in people with ID, Einfeld, Tonge, and Turner (1999) and Tonge and Einfeld (2000, 2003) found that behavioural problems tend to decline whereas emotional problems tend to increase over time, and that approximately 65% of the children with deviant levels of problem behaviour have persistent deviant problems. Similar findings were

reported in studies on children with ID representing different behavioural phenotypes (Cornish et al., 2004). Although most of these studies included a wide age-range, none investigated developmental trajectories of psychopathology in children with ID. Multi-cohort longitudinal studies are necessary to show whether the same changes with age are observed in different cohorts studied in different time periods. In order to understand more fully the stability, growth and continuity of psychopathology we need to investigate trajectories of behaviour over time.

Several studies in children without ID, using accelerated longitudinal designs (Bongers, Koot, van der Ende, & Verhulst, 2003; Kraatz Keiley, Bates, Dodge, & Pettit, 2000; Stanger, Achenbach, & Verhulst, 1997) show that developmental trajectories vary by type of psychopathology, viz. internalising behaviours increasing, and externalising behaviours decreasing with age (Bongers et al., 2003; Kraatz Keiley et al., 2000; McConaughy, Stanger, & Achenbach, 1992). The developmental trajectories of psychopathology are also found to vary by gender. The adolescent increase of emotional problems in girls, like depression, is not seen in boys. By contrast, disruptive behaviours emerge in early and middle childhood and decrease after adolescence

only in boys. Delinquency has also been shown to rise early in some boys and persist at least until adulthood, while in most other boys and in girls delinquency increases during adolescence and tapers off by their mid-twenties (Birmaher et al., 1996; Bongers et al., 2003; Burke, Loeber, & Birmaher, 2002; Kovacs & Devlin, 1998). It is unknown whether psychopathology develops in similar ways in young people with ID.

We might expect some differences in the developmental course of psychopathology in children with ID compared to children without ID due to 1) their limited communication skills, 2) additional stressors due to the ID, 3) higher prevalence of neurological deficits and genetic syndromes, and 4) limited independence.

First, children with ID are likely to have more difficulties expressing their feelings than children without ID, and are therefore likely to express internalising problems in a more externalising way, e.g., by acting out (Marston, Perry, & Roy, 1997). The onset of depression in children with ID might therefore show a later onset or a smaller increase compared to typically developing children.

Second, adolescence is a developmental period that taxes children's competences. It might be a period in which children with ID experience more stress as they face personal limitations in adaptive behaviour. Possibly children with ID develop more internalising behaviours in their struggle into adulthood than their typically developing counterparts (Bouras, 1994). In contrast to the hypothesis of expressive difficulties, this reasoning leads to expectations of increased internalising problems, which makes it difficult to make any firm hypotheses on the developmental course of internalising behaviours.

Third, neurological deficits (e.g., epilepsy) and genetic syndromes (e.g., fragile X) are stable conditions which are more prevalent in children with ID (State, King, & Dykens, 1997), and often co-occur with externalising behaviours (Thompson & Reid, 2002). In a study into psychiatric problems in children with neurobiological abnormalities, Goodman and Graham (1996) concluded that persistent neurobiological abnormalities are the underlying cause for both lower cognitive abilities and higher levels of psychopathology. Following this lead, we might expect a more stable developmental course of externalising behaviours in children with, compared to without, ID.

Fourth, it can be expected that youths with ID are less able to move around independently, because their carers keep a closer eye on them compared to carers of children without ID. This lower level of independence might cause a later onset of certain externalising behaviours like stealing and setting fires, and therefore lead to a smaller increase of delinquent behaviour over time than seen in children without ID.

To date, gender differences in the developmental course of problem behaviours in children with ID have

not been studied. We have no reason to believe that, in general, gender differences in the developmental course of psychopathology in children with ID are different from those in children without ID. The few exceptions to this are perhaps withdrawn behaviour, thought and social problems, since these are also associated with autism spectrum disorders, which are more common in ID and more common in boys (Steinhausen & Winkler Metzke, 2004), and therefore likely to show higher persistence in boys with ID.

In sum, the present study aimed to compare the developmental trajectories of parent-reported emotional and behavioural problems in children from age 6 to 18 years with, versus without, ID using age-based multilevel growth curve models. We also addressed gender differences.

Methods

The present study used all three assessment-waves of a large school-based study on psychopathology in children, aged 6–18 years, with moderate to borderline ID. For comparison we used the first three assessment-waves of the Dutch Mental Health Study of children without ID (non-ID) (for complete sample description see: Verhulst & Althaus, 1988; Verhulst, Berden, & Sanders-Woudstra, 1985; Verhulst, Koot, & Berden, 1990). Table 1 shows the basic sample characteristics of the children in each sample at each occasion and the number of participants per sample, age and wave (Time 1 to Time 3).

Participants with intellectual disabilities

At Time 1, almost 90% of all schools for the ID in the province of Zuid-Holland participated in this study and randomly selected 20% ($N = 1,615$) of their children. About 2% ($N = 48,800$) of all 6- to 18-year-old Dutch children attended a school for ID (about 20% of them in Zuid-Holland). Children with severe additional physical or sensory handicaps were usually not admitted to these, but to schools that specialise in these specific handicaps and were therefore not part of this study. Children with ID were unlikely to attend regular schools (Central Bureau of Statistics, 1999). About 75% of the ID sample attended a school for children with mild to borderline ID (IQ between 60 and 80) and 25% a school for children with moderate ID (IQ < 60). All participants signed an informed consent form.

At Time 1, 953 parents (response rate: 69%) completed the Child Behavior Checklist (CBCL) (Achenbach, 1991a; Verhulst, van der Ende, & Koot, 1996). About one year later, due to time and money constraints, a random sample of 58% of the Time 1 responders were contacted again (Time 2, response rate: 85%). About five years after the initial assessment (mean 5.2 years, $sd = .5$), of all 706 children who still fell within the 6 to 18 years age-range, parents of 509 children completed the CBCL (Time 3, response rate: 72%).

Of 1,396 eligible children with ID, 978 (70%) participated at least once, 257 (26%) participated in all three

Table 1 Number of subjects by time of assessment for children with (ID) and without ID (non-ID)

Age	Time 1				Time 2				Time 3				Total
	ID 1997		Non-ID 1983		ID 1998		Non-ID 1985		ID 2002		Non-ID 1987		
	M	F	M	F	M	F	M	F	M	F	M	F	
6	7	8	72	84			48	46					265
7	40	19	76	84	1	4	72	77					373
8	52	28	93	80	19	7	64	67			45	47	502
9	51	42	79	81	22	14	65	69			69	82	574
10	48	54	81	80	29	15	62	65	0	1	66	58	559
11	76	46	73	85	26	25	65	71	5	5	63	77	617
12	68	31	81	78	44	25	63	66	26	8	71	72	633
13	68	39	80	79	32	13	60	69	43	25	69	61	638
14	53	40	72	86	38	13	70	65	46	28	57	62	630
15	36	32	70	68	26	13	52	57	38	37	64	76	569
16	22	23	74	80	16	20	50	62	45	39	59	68	558
17	30	21	6	5	12	19	15	12	61	24	25	33	263
18	11	8			17	13			43	35	50	53	230
Total	562	391	857	890	282	181	686	726	307	202	638	689	
Low SES	55%		34%		50%		32%		54%		32%		
Boys	59%		49%		61%		49%		60%		48%		
Mean age (SD)	11.7 (2.9)		11.0 (3.2)		12.8 (2.9)		11.1 (3.1)		15.3 (2.0)		12.8 (3.0)		

Note: M = males; F = females; SD = standard deviation; SES = socio-economic status.

assessments, 433 (44%) participated twice, and 288 (30%) participated only once. These three groups of participants showed no significant differences for Time 1 CBCL scales: Total Problems ($F(1, 952) = .66, p = .42$); Externalising ($F(1, 952) = .81, p = .37$); Internalising ($F(1, 952) = .26, p = .61$), gender and level of ID. However, families who participated three times had a higher socio-economic status (SES) than families who participated once (OR = 2.07, $p < .01$) or twice (OR = 1.39, $p < .05$), and families who participated twice had a higher SES than families who participated only once (OR = 1.49, $p < .05$).

Participants without intellectual disabilities

Of 2,522 eligible 6- to 18-year-old non-ID children in the province of Zuid-Holland, 2,047 (81%) participated at least once, 972 (48%) participated at all three assessments, 516 (25%) participated twice, and 559 (27%) participated only once. These three groups of participants showed no significant differences in Time 1 CBCL: Total Problems Score ($F(1, 1746) = .26, p = .61$); Internalising ($F(1, 1746) = 1.59, p = .21$); and Externalising ($F(1, 1746) = .33, p = .57$). However, children from families with high SES (OR = 1.59, $p < .01$) and parents of daughters (OR = 1.42, $p = .01$) were significantly more likely to participate three times compared to respectively once or twice.

Measures

To assess emotional and behavioural problems in youths we used the Dutch version of the CBCL (Achenbach, 1991a; Verhulst et al., 1996). The CBCL has been validated for the Dutch general population (GP) of 4- to 18-year-olds (Verhulst et al., 1996) and has shown to have good to satisfactory reliability and validity in the GP as well as in our sample of children with ID (Dekker, Koot et al., 2002; Dekker, Nunn, &

Koot, 2002) and other ID samples (e.g., Koskentausta, Iivanainen, & Almqvist, 2004). The CBCL includes 118 problem behaviour items rated from 0 (not true) to 2 (very true or often true). The CBCL items are grouped into eight narrowband scales: Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behaviour and Aggressive Behaviour. Furthermore, the items can be grouped into two broad-band scales: Internalising (includes the first three narrowband scales) and Externalising (includes the last two narrowband scales). A Total Problems score is derived by summing the individual item scores.

Data analysis

We used the SAS PROC MIXED procedure to conduct Multilevel Growth Curve Analysis (Littell, Milliken, Stroup, & Wolfinger, 1996; Singer, 1998) to describe the developmental course of CBCL problem behaviours in children with and without ID, using three repeated measurements and age as an indicator of time. In this study, the within-subject variation was described by a random intercept and a random age effect. The between subject variation was described by the following parameters: intercept, age, sample (ID = 1, non-ID = 0), and gender (boys = 1, girls = 0). Additionally, we included the mean SES score per sample to control for SES differences between the two samples. The slope describes the average rate of change in problem behaviour across ages for each sample (Boyle & Willms, 2001). We used the root-mean-square error of approximation (RMSEA) to test the model-fit (Steiger, 1998). An RMSEA value of .05 or smaller suggests that the absolute magnitude of the discrepancies between the models and the data is small (Hu & Bentler, 1998). Values in the range of .05 to .08 indicate a fair, .08 to .10 a mediocre and values above .10 a poor fit (MacCallum, Browne, & Sugawara, 1996).

The raw CBCL scale scores were used to estimate the best multilevel growth curves, following the same procedure for each CBCL-scale. Age was centred at 6, resulting in an intercept representing the initial status of the problem behaviour at age 6. The two most important effects for our research questions were a) the interaction effect of sample by age, indicating a different developmental course from age 6 to age 18 between the two samples, and b) the three-way interaction of age by sample by gender, indicating a different developmental course from age 6 to 18 between boys and girls in children with ID versus children without ID.

Results

Table 2 presents the means and standard deviations of all CBCL scale scores separately for children with and without ID and for four age groups. Table 3 shows the parameters for each CBCL scale, including the between-subject level of the best-fitting model and corresponding model fit. The graphs in Figure 1 show the developmental course of problem behaviours (raw mean scale score on the Y-axis) with increasing age (X-axis) separately for children with (bold line with squares) and without ID (normal line

with circles). For example, a line that shows an increase (e.g., Somatic Complaints) indicates that children at age 18 have more somatic complaints compared to children at age 6 and that a child will get more somatic complaints as he or she grows older. When the growth curves of both samples are parallel to each other, developmental trajectories are similar.

For all CBCL scales, children with ID had a significantly higher level of problem behaviours at age 6 than children without ID and these levels remained higher across the age-range studied. Developmental courses varied across problem behaviours.

Whenever a significant age by sample interaction effect was present, we investigated whether the decrease was significant within the sample and between the genders (see italic figures in Table 3 for parameters and model fit in each sample separately). Whenever a significantly larger decrease of problem behaviour was found in children with ID, we additionally tested whether at age 18 the level of problem behaviour was still significantly higher in children with ID compared those without. On all scales children with ID remained to have a higher level of problem behaviours.

Table 2 Means (M) and standard deviations (SD) of the raw CBCL syndrome scores by age-group

Syndrome	6–8 yrs		9–11 yrs		12–14 yrs		15–18 yrs	
	ID	Non-ID	ID	Non-ID	ID	Non-ID	ID	Non-ID
Withdrawn 9 items								
<i>M</i>	3.16	1.70	3.13	1.91	3.48	1.96	3.38	2.14
<i>SD</i>	2.66	1.85	2.91	2.12	3.28	2.19	3.28	2.35
Somatic Complaints 9 items								
<i>M</i>	1.32	.65	1.45	.80	1.37	.90	1.54	1.12
<i>SD</i>	1.71	1.18	1.82	1.43	1.91	1.60	2.10	1.78
Anxious/Depressed 14 items								
<i>M</i>	3.56	2.20	3.88	2.59	4.04	2.31	4.02	2.33
<i>SD</i>	3.64	2.69	4.02	3.20	4.34	3.12	4.44	3.29
Social Problems 8 items								
<i>M</i>	4.70	1.34	3.98	1.51	4.14	1.33	3.64	.99
<i>SD</i>	2.98	1.82	3.01	2.06	3.11	1.97	3.02	1.63
Thought Problems 7 items								
<i>M</i>	.98	.26	.76	.26	.92	.23	.85	.26
<i>SD</i>	1.46	.66	1.35	.68	1.63	.72	1.45	.76
Attention Problems 11 items								
<i>M</i>	7.82	2.97	6.10	3.31	6.44	3.08	5.54	2.85
<i>SD</i>	3.87	2.92	4.06	3.23	4.19	3.07	3.92	3.03
Aggressive Behaviour 20 items								
<i>M</i>	11.66	6.75	9.08	5.94	8.44	4.83	6.43	4.21
<i>SD</i>	7.29	5.89	7.47	5.65	7.17	5.13	6.24	4.95
Delinquent Behaviour 13 items								
<i>M</i>	2.04	1.19	2.06	1.05	2.11	1.02	2.17	1.12
<i>SD</i>	2.25	1.52	2.28	1.55	2.50	1.73	2.91	1.92
Internalising 32 items								
<i>M</i>	7.88	4.51	8.26	5.22	8.64	5.10	8.69	5.47
<i>SD</i>	6.13	4.44	6.87	5.26	7.64	5.43	7.97	5.87
Externalising 33 items								
<i>M</i>	13.70	7.94	11.14	6.99	10.55	5.85	8.60	5.33
<i>SD</i>	8.98	6.90	9.25	6.72	9.06	6.39	8.55	6.38
Total Problems 118 items								
<i>M</i>	39.06	20.54	33.22	20.16	32.98	17.68	29.18	16.60
<i>SD</i>	21.34	15.10	22.04	15.98	22.95	15.70	22.10	15.76

Table 3 Model fit of final best model for each CBCL scale in all children, and separately (in *italic*) for children with (ID) and without (non-ID)

	Significant parameters in best fitting model	Baseline χ^2	Final χ^2	$\Delta \chi^2$	Δ df ^a	RMSEA ^b
Withdrawn	Intercept, age, sample, gender, age*gender, ses, age*ses, sample*ses, age*sample*ses	28420.6	28015.1	405.5	9	.04
Somatic Complaints	Intercept, age, sample, gender, age*gender, ses	23953.0	23524.0	429.0	6	.05
Anxious/Depressed	Intercept, age, sample, gender, age*gender, ses	32710.2	32400.9	309.3	6	.06
Social Problems	Intercept, age, sample, gender, age*sample, age*gender, age*sample*gender, sample*gender, ses, age*ses, sample*ses	28336.8	27160.6	1176.2	11	.05
<i>ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>9305.6</i>	<i>9230.8</i>	<i>74.8</i>	<i>4</i>	<i>.09</i>
<i>Non-ID</i>	<i>Intercept, age</i>	<i>17538.5</i>	<i>17488.5</i>	<i>50.0</i>	<i>2</i>	<i>.06</i>
Thought Problems	Intercept, age, sample, gender, sample*gender, ses, sample*ses	17934.5	17458.4	476.1	7	.04
Attention Problems	Intercept, age, sample, gender, age*sample, age*gender, ses, age*ses, sample*ses	32544.7	31739.2	805.5	8	.06
<i>ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>10316.8</i>	<i>10246.4</i>	<i>70.4</i>	<i>3</i>	<i>.10</i>
<i>Non-ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>21468.9</i>	<i>21412.5</i>	<i>56.4</i>	<i>3</i>	<i>.05</i>
Delinquent Behaviour	Intercept, age, sample, gender, age*sample, age*gender, ses	25931.6	25490.9	440.7	7	.05
<i>ID</i>	<i>Intercept, age, gender</i>	<i>8686.4</i>	<i>8654.9</i>	<i>31.5</i>	<i>3</i>	<i>.09</i>
<i>Non-ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>16590.3</i>	<i>16514.4</i>	<i>75.9</i>	<i>4</i>	<i>.06</i>
Aggressive Behaviour	Intercept, age, sample, gender, age*sample, age*gender, ses, age*ses	39266.5	38398.5	868.0	8	.06
<i>ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>12504.4</i>	<i>12279.1</i>	<i>225.3</i>	<i>4</i>	<i>.11</i>
<i>Non-ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>26369.5</i>	<i>26032.1</i>	<i>337.4</i>	<i>4</i>	<i>.08</i>
Internalising	Intercept, age, sample, gender, age*gender, ses	39613.6	39130.4	483.2	6	.06
Externalising	Intercept, age, sample, gender, age*sample, age*gender, ses, age*ses	41990.6	41277.4	713.2	8	.06
<i>ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>13379.4</i>	<i>13250.0</i>	<i>129.4</i>	<i>4</i>	<i>.11</i>
<i>Non-ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>28144.0</i>	<i>27886.1</i>	<i>257.9</i>	<i>4</i>	<i>.08</i>
Total Problems	Intercept, age, sample, gender, age*sample, age*gender, ses, age*ses, sample*ses	53404.9	52608.4	796.5	9	.07
<i>ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>16838.5</i>	<i>16745.7</i>	<i>92.8</i>	<i>4</i>	<i>.13</i>
<i>Non-ID</i>	<i>Intercept, age, gender, age*gender</i>	<i>35800.8</i>	<i>35673.5</i>	<i>127.3</i>	<i>4</i>	<i>.09</i>

Note: all models except Attention Problems included a random effect for intercept and age. Attention Problems included only a random intercept. Separate models for ID and non-ID were only calculated when a significant age*sample effect was found.

^a df = degrees of freedom; ^b RMSEA = root-mean-square error of approximation.

Internalising syndromes

Similar developmental courses were found for children with and without ID for Withdrawn, Somatic Complaints, Anxious/Depressed the Internalising scale (Figure 1).

Externalising syndromes

Children with ID showed a larger decrease of Aggressive Behaviour and Externalising from age 6 to age 18 than children without ID (age by sample interaction effect). In both samples Aggressive Behaviour decreased significantly. The developmental course of Delinquent Behaviour differed between the samples. In children with ID, the course was similar for both genders, while in children without ID males showed a steeper decrease than females.

Other syndromes

Children with ID showed a larger decrease of Attention Problems and Total Problems from age 6 to age

18 than children without ID (age by sample interaction effect). A different developmental course for gender within the two samples was found for Social Problems (age by sample by gender interaction effect), indicating a larger decrease in boys than in girls in the ID sample only. Males showed a significantly larger decrease in Attention Problems than females in both samples.

Discussion and conclusion

Concluding from cross-sectional studies, all common psychopathological problems seen in children without ID are also seen in children with ID, but at substantially higher levels. This study is the first to test the similarity of the developmental course of psychopathology in children with and without ID. We hypothesised that children with ID would show less change with increasing age in externalising behaviours than children without ID. For internalising problems we had no firm hypotheses.

Results showed that, in accordance with cross-sectional studies, children with ID had a significantly

higher level of problem behaviours, across all ages, than children without ID. Also, Attention Problems (including items like ‘Can’t concentrate’) and Aggressive Behaviour (e.g., ‘Mean to others’) in both genders and Social Problems (e.g., ‘Is teased’) in males showed a steeper developmental decrease in children with ID. Gender differences were alike in both samples, except for Social Problems. Thought Problems (e.g., ‘Repeats actions’, ‘Strange behaviour’), which had a stable developmental course, was found to have a different gender effect in children with ID than in children without ID.

Differences in developmental courses between ID and non-ID

In the introduction, we mentioned four possible reasons for differing developmental courses between children with and without ID. Overall we expected a more stable developmental course in children with ID. This was, however, not found, so potential factors like the higher prevalence of neurological deficits and

ID-related syndromes, lower levels of independency and difficulty in expressing feelings in children with ID do not seem to have a major effect on the stability of the developmental course of psychopathology. Hypothesised effects of higher levels of experienced stress in this sample could also not be demonstrated. Although we know that children with ID are more at risk for psychopathology due to lower levels of SES (Dekker & Koot, 2003), we found no differences with increasing age between children with and without ID that were attributable to SES effects.

Differences in developmental course of internalising problems

No difference in developmental course or in gender effect on the developmental course was found between children with and without ID for the CBCL scales reflecting internalising problems. This suggests that the emotional development in puberty and the accompanying different coping styles for boys and girls in children without ID (e.g., Birmaher et al.,

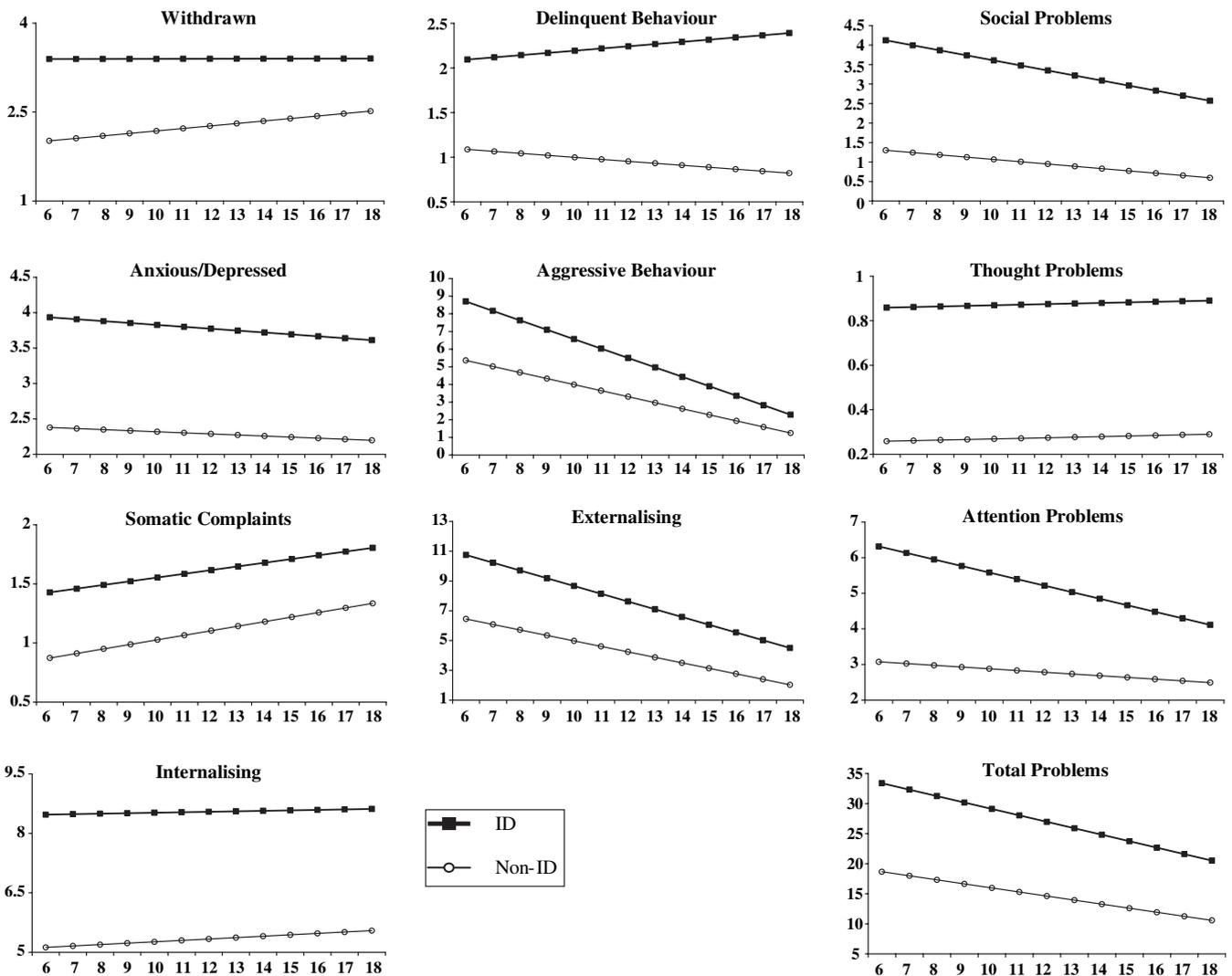


Figure 1 Developmental course of CBCL problem behaviours. Ages are shown on the X-axis. The Y-axis represents the raw scale score

1996) play a similar role in the development of internalising problems in children with ID. The effect of having ID on emotional problems does not seem to aggravate with age.

An interesting result was found for Social Problems. Males with ID showed a significantly steeper decrease in social problems from childhood into adulthood than males without ID and all females. A possible explanation for this effect might be that when boys with ID leave school, they start working at manual jobs. The 'bold' male colleagues in this work environment might demand more social skills from them than they were used to at school, and force them to socialise and become more assertive and self-confident (Mueser et al., 1997).

Differences in developmental course of behavioural problems

The only differences in developmental course of behavioural problems between children with and without ID were larger decreases in aggressive behaviour and attention problems. Previous studies in ID found attention problems to be more persistent in primary school children without ID (e.g., Handen, Janosky, & McAuliffe, 1997), suggesting a smaller decrease in contrast to the larger decrease we found. In our study, we also included children who entered secondary school. Entrance into (specialised) secondary education might reduce the cognitive school tasks for children with ID, because they are taught more practical subjects instead of theoretical subjects. This might lead to lower levels of observed attention problems.

The decreasing developmental course of the CBCL Externalising scale found in this study was consistent with other studies in both children with (McCarthy & Boyd, 2001) and without ID (e.g., Kraatz Keiley et al., 2000; Stanger et al., 1997). However, since disruptive behaviours were found to be very persistent over time in children with ID, despite a decline in level (Einfeld et al., 1999; Richardson et al., 1985; Tonge & Einfeld, 2003), the larger decrease across age in externalising behaviours than in children without ID was unexpected. A possible explanation might be that the level of these behaviours is especially higher at younger ages. Children with ID might go through developmental stages in a reduced pace and, due to lacking or delayed communication skills in childhood, they express their feelings of discomfort, inattention and impulsivity in aggressive behaviours. Consequently, as they grow older more appropriate expressive skills are acquired, and aggressive behaviours will diminish to a level which is only slightly elevated compared to children without ID (Bouras, 1994). Similar declines in aggression are seen in typically developing children at a younger age (e.g., Tremblay, 2003).

Limitations

As our sample of children with ID was studied on three occasions, our data analytic possibilities were limited to testing linear effects only. In a study into the normative development of problem behaviours in children without ID aged 4 to 18 years, Bongers et al. (2003) employed two additional occasions from the same general population (GP) sample used in our study and were therefore able to test for quadratic effects. A curvilinear growth model best described the development of Internalising, Anxious/Depressed, Externalising, Aggressive Behaviour, Delinquent Behaviour, Attention Problems and Social Problems. Especially the latter three types of problems showed a different picture in our study. Bongers et al. found that Delinquent Behaviours decreased from ages 4 to 11 and increased into adulthood, while we could only detect a decrease. Attention Problems and Social Problems both followed an increasing course from ages 4 to 11 and a decreasing course into adulthood, which was largest in Social Problems, while we again could only demonstrate a decrease.

Another limitation of the present study was the difference in birth dates between the ID (1979–91) and non-ID (1965–79) sample. In a recent study into time trends it was shown that both emotional and conduct problems increased over time in 15/16-year-olds without ID from the GP as studied in birth-cohorts from 1958, 1970 and 1984 (Collishaw, Maughan, Goodman, & Pickles, 2004). Assuming a continuation of this time trend, the overall difference between children with and without ID in level of problem behaviours might actually be smaller than suggested by our analyses. Policies concerning admittance to special education in the Netherlands did not change between the first assessment of our non-ID sample and the first assessment of our ID sample (Sociaal Cultureel Planbureau, 1998). Furthermore, children who received special education were excluded from the original non-ID sample. The potential influence of later changes in public policy, e.g., efforts to make schools for regular and special education work together more closely, on the difference in developmental course, however, remains unclear.

Follow-up studies using parent-reported problem behaviour questionnaires are known to show a lower prevalence at later assessments (e.g., Verhulst & Althaus, 1988). This phenomenon might have influenced our results too, although our age-based design minimises the effect.

Finally, the model fit for Attention Problems, Aggressive Behaviour, Externalising and Total Problems for the ID sample was not good enough to draw definite conclusions. Increasing the number of assessment-waves using the total sample might help to obtain better model fit.

Future research

We would suggest future studies on the developmental course of psychopathology in children with ID to have the following focus. First, we suggest testing for curve-linear effects by including extra assessment-waves, to provide more detailed information about the age of onset of increase and decrease of problem behaviours. Second, in typically developing youths, several pathways for delinquent behaviour have been identified, including adolescence-limited and life-course persistent (Moffitt, 1993). By studying latent classes of problem behaviours in children with ID, comparable taxonomic categories might be revealed. Third, CBCL scales are found to be predictive of psychiatric disorders (Ferdinand et al., 2004), and it would be interesting to see whether certain problem behaviours present during childhood are precursors of psychiatric disorders in adolescence and adulthood. Fourth, differences in developmental course might emerge when the four possible reasons for difference in developmental course between children with and without ID, mentioned in the introduction, are studied more specifically. Finally, it might be interesting to look into differences in developmental course of psychopathology between children with different levels of ID. Children with severe and profound ID are more likely to have genetic and physical disorders, while children with mild ID are more likely to come from low SES families. These factors are known to be highly correlated with the presence of psychopathology and might influence the developmental course.

Implications

The developmental courses resulting from this study provide clinicians, parents, caregivers and researchers with important information on the course of emotional and behavioural problems in children with ID. They can also be used as a basis against which the development of problem behaviours in children with ID can be compared, individually or as a group, for example in future studies.

A slower development in general of children with ID makes them more vulnerable to emotional or behavioural problems. Parents, mental health professionals and other care givers should be aware of this. Professionals should inform parents of the capacity, behaviour and emotions of their child and assist them in being realistic about expectations.

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