Symptom diagnostics based on clinical records: a tool for scientific research in child psychiatry?

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Abstract *Introduction* Child psychiatric diagnoses are generally based on a clinical examination and not on standardized questionnaires. The present study assessed whether symptom diagnostics based on clinical records facilitates the use of non-standardized clinical material for research. *Method* Six hundred and eighty-five children, referred to a third level child psychiatric centre in the Netherlands, were, after extensive multidisciplinary examination, classified according to the multi-axial classification scheme for psychiatric disorders in childhood and adolescence (MAC-ICD-9). By two raters 44 behavioural symptoms were scored based on the clinical records of these children. Interrater agreement on symptoms in 50 records was performed. Principal components analysis on symptom scores of all children was performed; factor scores were related with MAC-ICD-9 classifications. *Results* Interrater reliability for behavioural symptoms was excellent ($\kappa = 0.88$). Many children with psychiatric problems suffer from a large number of behavioural symptoms. Factor scores of the symptoms revealed recognizable and well interpretable entities and indicated overlap in symptomatology and comorbidity. *Conclusion* A symptom-based diagnostic approach based on extensive clinical patient files may provide a special dimension to improve the reliability of psychiatric classification.

Key words child psychiatric classification – symptom diagnostics – dimensional approach – reliability – comorbidity

Introduction

The aim of psychiatric classification is to facilitate communication among medical professionals, caregivers, educational experts, and people involved in a patient's treatment as well as use in scientific research [1, 18]. The classification of a patient's disorder is based on thorough clinical investigation which increasingly relies on structured diagnostic interviews and questionnaires. The use of structured diagnostic interviews can improve reliability and consistency of classification. The advantage of questionnaires is standardization [16, 18]. However questionnaires often focus on specific types of disturbances, such as anxiety, depression, or bipolar diseases. Another objection encountered in the use of questionnaires is that often multiple data sources are used, and each assessor of the

ECAP 726

child's behaviour has different information about the child and knowledge of child psychiatry [17, 18]. The use of clinical classifications also has an inherent disadvantage due to variable reliability, particularly in regard to disorders, where interrater reliability varies from moderate to excellent: for example reliability is good to excellent for ADHD and separation anxiety, fair for generalized anxiety and obsessive compulsive disorder (OCD) and conduct disorder (CD) [16, 21, 24]. This variability in reliability can partially be explained by the overlap of symptomatology in diverging clinical psychiatric syndromes and by comorbidity [2, 3, 6, 9, 21, 23]. In classification, this may lead to differences of interpretation, for example in the principle diagnosis. To evaluate the suitability of clinical material for use in research we explored whether symptom scoring on the basis of non-standardized clinical material is feasible and may be interpreted in terms of clinical diagnosis. In research the addition of dimensional elements in classification systems is becoming progressively more important [4, 12, 13, 18, 19]. Dimensional elements may help to distinguish differences in individual disorder severity and clinically significant features subsumed by other disorders [4, 11, 14]. They also can help determine comorbidity and overlap of symptomatology.

Our study was conducted in the framework of a larger study on neurobehavioral relationships in children with psychiatric morbidity. Its aim was to investigate whether it is possible to improve insight into the structure and value of child psychiatric classifications with the help of additional scoring of symptoms noted in the clinical record. To this end we assessed the clinical records of 705 children who were referred to a centre for child and adolescent psychiatry in the Netherlands.

The following research questions were investigated:

1. Is it possible to score psychiatric symptoms reliably on the basis of carefully recorded, but non-standardized clinical material?
2. Assuming this were possible, does principal components analysis of the symptoms reveal the presence of clinically recognizable and reliably interpretable entities?

Methods

Participants

The study population consisted of 705 children who between 1984 and 1999 had been referred to "Fornhese", a third-level regional diagnosis and treatment centre for children with psychiatric problems and their families. Fornhese is a subsidiary of the psychiatric centre "Symfora Group" in Amersfoort, the Netherlands. Table 1 presents the significant demographic characteristics of the children. Approximately three quarters of them were boys (73%). The majority (98%) were aged between 4 and 12 years old, averaging 9.0 years (SD ±2.05). Thirty-nine percent were in special education programs.

Table 1 Demographic characteristics of study participants ($N = 705$)

Characteristic	n	%
Gender		
Boys	513	73
Girls	192	27
Age (years)		
2–3	10	1
4–6	116	17
7–8	218	31
9–10	247	35
11–12	106	15
13–16	8	1
Education		
Mainstream primary	414	59
Special primary	272	39
Secondary	6	1
Other/ none	13	2
Socio-economic status[a]		
Low	217	31
Middle	296	42
High	157	22
Missing	35	5

[a]According to the highest education of the mother

Procedure

All children were examined according to standard diagnostic procedures by a team consisting of a child psychiatrist (MdJ), a psychologist/physical therapist (JMP), a family therapist, a psychotherapist, and a play therapist, each of whom was assigned specific tasks. The standard diagnostic program consisted of history taking, including developmental history and a parental report, family diagnostics, child psychiatric and neuropsychiatric examination, and the gathering of relevant prior diagnostic data and school information. Members of the diagnostic team were careful to assess the children with an open mind and to avoid jumping to clinical conclusions. This means that signs and symptoms were recorded even if they do not belong primarily to a specific psychiatric disorder. If indicated, the standard diagnostic program was supplemented with other examinations, such as psychodiagnostic assessments, specific educational assessments, occupational therapeutic assessments, supplementary medical examinations. All examinations were recorded in detail in written form. The final diagnoses were established by consensus in a

team conference on the basis of all collected information. This resulted in a classification according to MAC-ICD-9 (multi-axial classification scheme for psychiatric disorders in childhood and adolescence [7, 20]), the child psychiatric adaptation of the ICD-9 (International Classification of Diseases, version 9, World Health Organization [21]). For the classification of dyslexia as a clinical psychiatric syndrome, the DSM-IV (diagnostic and statistical manual of mental disorders, American Psychiatric Association [1]) was used, since the MAC-ICD-9 does not classify this as a clinical psychiatric syndrome on Axis I, but as a specific developmental disorder on Axis II. The diagnostic assessment procedure for children referred for dyslexia was identical to that of the other children.

To assess child psychiatric symptoms, we developed a behavioural symptom list on the basis of the most distinct criteria for each MAC-ICD-9 clinical

Table 2 Symptoms, based on the most distinct criteria for each MAC-ICD-9 category, their absolute and relative frequencies and interrater agreement calculated with square-weighted Cohen's kappa ($N = 685$)

MAC-ICD-9 category	Symptom	*n*	%	Squared weighted Cohen's kappa (95% CI)
Autistic spectrum disorders	1. Impairment in the development of social attachment	304	44.4	0.93 (0.84–1.00)
	2. Disturbances in communication	357	52.1	0.87 (0.76–0.98)
	3. Disturbances in thinking and/or imaginative play	137	20.0	0.93 (0.79–1.00)
	4. Stereotyped and/or rigid behaviour	316	46.1	0.90 (0.80–1.00)
	5. Impairment in verbal and/or nonverbal language	107	15.6	0.90 (0.70–1.00)
	6. Impairment in eye-to-eye contact	109	15.9	0.88 (0.73–1.00)
	7. Psychotic phenomena	27	3.9	1.00 (1.00–1.00)
Neurotic disorders	1. Generalized anxiety	412	60.1	0.73 (0.51–0.95)
	2. Obsessive compulsive symptoms	64	9.3	1.00 (1.00–1.00)
	3. Lasting depression (more than 3 months)	115	16.8	0.90 (0.78–1.00)
	4. Bodily complaints and/or disturbances without medical reason	171	25.0	0.91 (0.83–1.00)
	5. Sleeping problems	231	33.7	0.98 (0.94–1.00)
	6. Anxiety as phobic state	54	7.9	1.00 (1.00–1.00)
Adjustment disorders	1. Brief depressive reaction	10	1.5	0.66 (0.03–1.00)
	2. Disturbance of other emotions such as anxiety, fear or worry	20	2.9	a
	3. Mild or transient disturbance of conduct	2	0.3	a
	4. Elective mutism	8	1.2	1.00 (1.00–1.00)
Disturbance of emotions specific to childhood and adolescence	1. Anxiety and fearfulness without stressors	479	69.9	0.76 (0.63–0.89)
	2. Misery and unhappiness without stressors	312	45.5	0.84 (0.73–0.96)
	3. Shyness and social withdrawal without stressors	367	53.6	0.80 (0.67–0.92)
	4. Relationship problems without stressors	260	38.0	0.84 (0.72–0.95)
Hyperkinetic disorders	1. Disturbances in attention and/or concentration	474	69.2	0.76 (0.62–0.90)
	2. Hyperactivity	336	49.1	0.77 (0.63–0.91)
	3. Impulsiveness	267	39.0	0.82 (0.67–0.96)
	4. Excessive reactions to environmental stimuli	90	13.1	1.00 (1.00–1.00)
	5. Hypoactivity	160	23.4	0.54 (0.32–0.77)
Disturbance of conduct not elsewhere classified	1. Aggressive and destructive behaviour, long-lasting and difficult to influenced	346	50.5	0.87 (0.77–0.97)
	2. Individual delinquent behaviour, long-lasting and difficult to influenced	66	9.6	0.96 (0.90–1.00)
	3. Disturbances of social conduct	5	0.7	a
	4. Compulsive conduct disorder such as gambling, stealing, etc.	5	0.7	b
	5. Negativism long-lasting and difficult to influenced	367	53.6	0.84 (0.71–0.97)
	6. Persistent disobedience, long-lasting and difficult to influenced	372	54.3	0.83 (0.73–0.93)
Special symptoms or syndromes not elsewhere classified	1. Stuttering	46	6.7	1.00 (1.00–1.00)
	2. Eating disorders	103	15.0	0.84 (0.68–1.00)
	3. Specific disorders of sleep	129	18.8	0.81 (0.59–1.00)
	4. Enuresis	138	20.1	0.97 (0.93–1.00)
	5. Encopresis	42	6.1	0.92 (0.82–1.00)
	6. Tics	82	12.0	1.00 (1.00–1.00)
	7. Stereotyped repetitive movements	70	10.2	1.00 (1.00–1.00)
	8. Trichotillomania	3	0.4	b
Specific developmental disorders	1. Arithmetical disorder	252	36.8	0.86 (0.76–0.95)
	2. Motor retardation	496	72.4	0.93 (0.86–1.00)
	3. Developmental dyslexia and/or spelling disorder	304	44.4	0.96 (0.91–1.00)
	4. Developmental speech/language disorder	289	42.2	0.81 (0.71–0.91)

[a]Cohen's kappa could not be calculated. One assessor scored exclusively '0', the other scored '1' once
[b]Cohen's kappa could not be calculated. Both assessors scored exclusively '0'

psychiatric syndrome (Axis I), to which we added specific (Axis II) developmental disorders (e.g., developmental dyslexia, motor retardation). This list consisted of 44 items (Table 2), presented in random order. Two researchers (TH and MS), who were blind to the child's final diagnostic description and clinical classification and whose information about each child was restricted to the information in the clinical record, scored each item on a three-point scale ("not applicable", "somewhat or sometimes applicable", "distinctly or often applicable") on the basis of diagnostic data from patient files. Six hundred and eighty-five files could be assessed in this way; the other 20 files were no longer available. To determine interrater reliability of symptom scores, 50 of total 685 files were selected at random and scored by both researchers separately.

Statistical analysis

Interrater reliability for the 44 items of the symptom list was, due to their ordinal level of measurement, determined by square-weighted Cohen's kappa [5]. Kappa's were calculated by the statistical package AGREE, version 7.002, and were interpreted according to Landis and Koch [15].

The interrelationships of the symptoms were investigated by principal components analysis (PCA) with Varimax-rotation. The median standardized factor score of each symptom was compared to the MAC-ICD-9 clinical psychiatric syndromes, using the Kruskal–Wallis test. This non-parametric test was chosen since the non-homogeneity of the variances did not allow for a parametric test. Post hoc comparisons were made by using the method described by Siegel and Castellan [22].

PCA and Kruskal–Wallis test were performed by use of the Statistical Package for Social Sciences (SPSS), version 12.1. Results were considered statistically significant at $P < 0.05$.

Results

Prevalence of clinical psychiatric syndromes

The prevalence of the clinical psychiatric syndromes in the study population ($n = 685$), listed MAC-ICD-9 order, was:

- Autistic disorders ($n = 120$; 18%); in this context autistic disorders includes all disorders in the autism spectrum
- Neurotic disorders ($n = 54$; 8%)
- Adjustment disorders ($n = 89$; 13%)
- Disturbance of emotions specific to childhood and adolescence ($n = 210$; 31%)
- Hyperkinetic disorders ($n = 54$; 8%)
- Disturbance of conduct not elsewhere classified ($n = 76$; 11%), henceforth referred to as CDs
- Special symptoms or syndromes not elsewhere classified (tics, stuttering, disorders of eating, etcetera) ($n = 30$; 4%)
- Dyslexia ($n = 44$; 6%); not mentioned as psychiatric syndrome on Axis I in the MAC-ICD-9, but as a specific disorder in development on Axis II
- No psychiatric diagnosis ($n = 8$; 1%); no child psychiatric problems were found after child psychiatric assessment.

Prevalence of symptoms

The prevalence of each symptom is shown in Table 2. In 20% of children, eight or fewer symptoms were identified, in 33%, nine to 12 symptoms, in 30%, 13 to 16 symptoms, in 16%, 17 or more symptoms.

Interrater reliability of symptom scoring

The mean kappa of items in the psychiatric symptom list was 0.88 (Table 2). Interrater reliability was 'very good' for 32 items ($\kappa > 0.80$), 'good' for six items ($0.66 < \kappa \leq 0.80$) and 'moderate' for one item (hypoactivity; $\kappa = 0.54$). The Cohen's kappa for five infrequent symptoms could not be determined, but both assessors had high levels of agreement; on two of the five items both assessors scored '0', for three items, one assessor consistently scored '0', the other scored '1' once.

Principal component analysis of the symptoms

Six symptoms which were scored in less than 2% of the children were not included in PCA: 'brief depressive reaction', 'socialised disturbance of conduct', 'mild or transient disturbance of conduct', 'elective mutism', 'trichotillomania' and 'compulsive CDs'.

PCA was performed for the remaining 38 symptoms in 677 subjects (in eight subjects one or more symptoms was missing). PCA produced 12 Eigenvalues greater than unity. The scree-plot however indicated that the elbow of the plot, which separates the most important factors, was situated after six factors. Therefore, and for reasons of interpretation, we chose the six-factor solution. The six factors combined explained 37.4% of the total variance. Rotated factor loadings greater than 0.3 and the variance

Table 3 Results of principal components analysis of the remaining 36 symptoms, scored in more than 2% of the participants ($N = 685$)

Symptom Percent variance explained	Factor 1 8.5%	Factor 2 8,2%	Factor 3 6.5%	Factor 4 5.3%	Factor 5 5.1%	Factor 6 3.8%
Impairment in the development of social attachment	0.71					
Stereotyped repetitive movements	0.56					
Disturbances in communication	0.55					
Impairment in eye-to-eye contact	0.54					
Disturbances in thinking and/or imaginative play	0.52					
Impairment in verbal and/or nonverbal language	0.51					
Stereotyped and/or rigid behaviour	0.50			0.39		
Developmental speech/language disorder	0.50				0.32	
Excessive reactions to environmental stimuli	0.41					
Hyperactivity		0.73				
Impulsiveness		0.71				
Persistent disobedience		0.69				
Aggressive/destructive behaviour		0.64				
Relationship problems without stressors		0.63				
Disturbances in attention and/or concentration		0.57			0.37	
Individual delinquent behaviour		0.32				
Negativism			0.71			
Misery and unhappiness without stressors			0.71			
Lasting depression			0.59			
Hypoactivity			0.48			
Shyness and social withdrawal without stressors	0.40		0.48			
Anxiety and fearfulness without stressors			0.38			
Bodily complaints and/or disturbances without medical reason			0.35			
Obsessive compulsive symptoms				0.57		
Anxiety as phobic state				0.54		
Sleeping problems				0.47		
Psychotic phenomena				0.46		
Generalized anxiety				0.44		
Tics				0.31		
Developmental dyslexia and/or spelling disorder					0.69	
Arithmetical disorder					0.66	
Motor retardation	0.33				0.38	
Enuresis						0.60
Encopresis						0.60
Eating disorders				0.33		0.40
Specific disorders of sleep						0.35

Principal component analysis with Varimax rotation, only loadings greater than 0.3 are shown

explained by each extracted factor are shown in Table 3. Two of the 38 symptoms showed factor loadings less than 0.3 on each of the six extracted factors: 'stuttering' and 'adjustment reaction with predominant disturbance of other emotions as anxiety, fear or worry'. Six items had factor loadings greater than 0.3 on two factors.

The following six factors were extracted: (1) a factor, we call *autistic symptoms*, isolated the symptoms of the autistic disorders except 'psychosis'. Also isolated were 'stereotyped repetitive movements', 'excessive reactions on environmental stimuli' and 'developmental speech/language disorders'. (2) On the second factor, called *disorders in attention, activity and conduct*, three symptoms of hyperkinetic disorders and three symptoms of CDs had high loadings. (3) The factor *emotional disabilities* had high loadings of three items of disturbance of emotions specific to childhood and adolescents, plus 'negativism', 'lasting depression', 'hypoactivity' and 'bodily complaints'. (4) The factor anxiety and OCD isolated four items of neurotic disorders with the addition of 'psychosis' and 'tics'. (5) The factor *learning disabilities with deficits in attention and motor control* had high loadings for 'dyslexia and spelling disorder', 'arithmetical disorder' and 'motor retardation'. (6) The factor, called *functional disorders,* isolated four items of the syndromes Not Otherwise Specified.

Relationship of clinical psychiatric syndromes (MAC-ICD-9) and symptom factors

Median standardized factor scores for each MAC-ICD-9 syndrome are shown in Table 4. All outcomes were statistically significant at $P < .05$. Post hoc comparisons reveal some clear differences for the first, second and fifth factor.

Table 4 Median standardized factor scores by MAC-ICD-9 category compared by means of the Kruskal–Wallis test ($N = 677$)

		Factor 1 Autistic symptoms	Factor 2 Disorders in attention, activity and conduct	Factor 3 Emotional disabilities	Factor 4 Anxiety and obsessive compulsive disorders	Factor 5 Learning disabilities with deficits in attention and motor control	Factor 6 Functional disorders
MAC-ICD-9	*N*	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)
1. Autistic disorders	120	1.12 (1.83)	−0.03 (1.49)	−0.21 (1.52)	0.02 (1.49)	−0.31 (1.40)	−0.21 (1.17)
2. Hyperkinetic disorders	54	−0.28 (1.28)	1.17 (1.91)	−0.51 (0.89)	−0.01 (0.86)	0.68 (1.54)	−0.34 (1.23)
3. Neurotic disorders	54	−0.54 (0.54)	−0.46 (1.17)	0.52 (1.59)	0.23 (1.62)	−0.41 (1.37)	−0.09 (1.18)
4. NOS	30	−0.71 (0.73)	−0.78 (0.83)	−0.48 (1.40)	−0.29 (1.53)	−0.10 (1.46)	0.66 (2.09)
5. Adjustment disorders	89	−0.58 (0.73)	−0.53 (0.95)	−0.03 (1.29)	−0.43 (0.81)	0.21 (1.37)	−0.42 (0.70)
6. Conduct disorders	76	−0.32 (0.92)	0.28 (1.56)	−0.33 (1.03)	−0.31 (0.97)	−0.48 (1.03)	−0.35 (1.25)
7. Emotional disturbance	210	−0.16 (1.00)	0.06 (1.48)	0.16 (1.49)	−0.26 (0.94)	−0.18 (1.59)	−0.28 (1.13)
8. Specific developmental disorders	44	−0.75 (0.39)	−0.96 (0.61)	−1.07 (0.57)	−0.56 (0.49)	0.54 (0.80)	−0.35 (0.33)
Kruska–Wallis test							
Chi-Square ($df = 7$)		207.3	131.9	93.7	38.0	65.7	21.1
P		0.000	0.000	0.000	0.000	0.000	0.004
Group Comparison[a]		1 > 2, 3, 4, 5, 6, 7, 8 2, 5, 6, 7 > 8 2 > 5 7 > 3	2 > 1, 3, 4, 5, 7, 8 6 > 3, 4, 5, 8 1, 5, 7 > 8 7 > 3	3 > 1, 2, 6, 8 7 > 1, 2, 8 1, 2, 4, 5, 6 > 8	1, 2, 3 > 5, 8	2, 8 > 1, 3, 6, 7 8 > 4, 5	4 > 2, 5, 8

IQR interquartile range, *NOS* special symptoms or syndromes not elsewhere classified, *Emotional disturbance* disturbance of emotions specific to childhood and adolescence

[a]Post-hoc group comparisons were made using the method described by Siegel and Castellan [22]

Children classified as having an autistic disorder according to MAC-ICD-9 scored significantly higher on factor one, *autistic symptoms*, than children with other MAC-ICD-9 syndromes. Children classified as having a hyperkinetic disorder or as having a CD according to MAC-ICD-9 scored significantly higher on factor two, *disorders in attention, activity, and conduct*, than children with most other MAC-ICD-9 syndromes. The difference was substantially greater for hyperkinetic disorders than for CDs. Children with dyslexia and those with the clinical psychiatric syndrome hyperkinetic disorders scored significantly higher on factor five, *learning disabilities with deficits in attention and motor control*, than children with other MAC-ICD-9 clinical psychiatric syndromes. The relationship between the other three factor scores and MAC-ICD-9 classifications was less specific.

Discussion

The present study indicates that it is possible to score psychiatric symptoms reliably from clinical material collected in a non-standardized way. Principal components analysis of the symptoms yielded well interpretable, clinically recognizable entities with reasonable correspondences to the clinical psychiatric syndromes. It also illustrated the existence of a substantial amount of overlap in symptomatology and comorbidity.

Methodological considerations

It might be considered a weak point that we used the MAC-ICD-9 instead of more recently developed classification systems such as the DSM-IV for the classification of clinical syndromes. The use of this older system is due to the fact that the project started in 1984. We considered continued use of the MAC-ICD-9 classification system more reliable than a mid-course change in the classification system, since conversion of the oldest data to another system would have entailed the loss of information. An additional argument to continue with the MAC-ICD-9 was that in our opinion more recent systems initially paid less attention to the child's developmental and environmental variables does than the MAC-ICD-9.

MAC-ICD-9 was also used to generate the list of the most prevalent child psychiatric symptoms. The use of the most prevalent symptoms implies that the list is not profuse. This underscores the notion that the present symptom list cannot replace clinical diagnostics and classification. In addition, it should be noted that rarely occurring symptoms such as 'trichotillomania', 'elective mutism', 'gambling and stealing', and 'disturbance of social conduct' were not included in PCA.

It is also noteworthy that symptoms belonging to the MAC-ICD-9 clinical syndrome of adjustment disorders were scored infrequently. Possibly the patient files did not provide sufficient information about

temporary aspects of the adjustment disorder. The most likely explanation is that the signs of maladjustment were interpreted as mild signs of other disorders, such as emotional disorder.

A limitation of the PCA based on symptoms noted in clinical records is that any bias in the clinically collected information is by definition transferred to the relevant clinical symptom association. In other words, a PCA based on symptoms noted in clinical records cannot be compared to PCA based on indications derived from standardized and unbiased questionnaires.

Symptom diagnostics, like other dimensional approaches, have the limitation that symptoms only are a part of the expression of the childhood psychopathology, so it can never replace a classification system in which all aspects of development, somatic conditions, family history and genetics are taken into account.

The strength of the present study is the study population, which was not a selected university hospital population, but consisted of a large number of children referred to a regional centre for child psychiatry. This implies that our population can be considered a reliable representation of the general psychiatric population. In addition, our data were not based on behavioural information collected by means of questionnaires, but on extensive child psychiatric diagnostics, including an interview. Hartman et al. [10] demonstrated that information based on a psychiatric interview is considerably more reliable than that those based on questionnaires.

Practical implications

Symptom diagnostics provide information about the presence or absence of psychopathology and about the degree to which psychopathology manifests itself in the individual patient. Our study indicated that many children with psychiatric problems suffer from a large number of symptoms. This may explain why diagnostics at the clinical classification level is difficult and relatively unreliable. It also reflects the comorbid nature of childhood psychiatric disorders.

The data on the relationships between the MAC-ICD-9 clinical syndromes and the symptom based factor scores nicely illustrated two phenomena which complicate diagnostics in children with psychiatric morbidity, i.e. criterion overlap (the fact that similar symptoms are used for the classification of different syndromes) and comorbidity. For example, our findings indicated that children with hyperkinetic disorders often had problems in motor control in combination with learning disabilities. The combination of hyperkinetic disorder and problems in motor control is well known and referred to in the literature as deficits in attention, motor control, and perception (DAMP [8]).

The results also demonstrated that factor scores *autistic symptoms* (factor 1), *disorders in attention, activity and conduct* (factor 2) and *learning disabilities with deficits in attention and motor control* (factor 5) corresponded strongly to their related clinical psychiatric syndromes. Factor scores *emotional disabilities* (factor 3), *anxiety and obsessive compulsive disorders* (factor 4), and *functional disorders* (factor 6) were less specific for a MAC-ICD-9 classification. One possible explanation for this finding is that the MAC-ICD-9 classification system, from which all of the symptoms are derived, includes many mixed disorders hallmarked by comorbidity [16]. The substantial degree of criterion overlap, the fact that clinical psychiatric syndromes are insufficiently discriminating, and the presence of comorbidity we consider to be important contributing factors to the variability in interrater reliability in child psychiatric classification. Factors such as referral bias and specific features of the clinician (i.e. education level, experience, work setting) and the variance in sources of information about the child also play a part in this process. The variability in interrater reliability for the classification of different clinical psychiatric syndromes is cause for concern, particularly since governmental and institutional policies are increasingly based on these classifications.

Concluding remarks

The present study indicated that diagnostic material, as acquired by an extensive, systematic diagnostic process, and elaborately documented in patient files, is suitable for evaluation by third party assessors and therefore for scientific research. Scoring of problematic behaviour as symptoms on the basis of diagnostic material has turned out to be possible with a high level of reliability. Symptom diagnostics based on extensively documented patient files of careful, but non-standardized child psychiatric assessments support the reliability of classification by addition of a special dimension to classification. Hence our study suggests that for child psychiatric research, this symptom-based dimensional diagnostic approach is a strengthening tool. The dimensional approach highlights the overlap in symptomatology and of

comorbidity and facilitates insight in the type and severity of individual psychopathology, and thereby on the impact on the child's social environment. In turn, improved insight has implications for treatment. However, symptom diagnostics cannot replace clinical diagnostics in child psychiatry.

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