ADHD and language impairment
A study of the parent questionnaire FTF (Five to Fifteen)

Abstract  The parental questionnaire FTF (Five to Fifteen) was given to parents of 76 children (mean age 11 years) diagnosed with ADHD. About half of the children had at least once been referred to a speech- and language pathologist. Most of them had not received any intervention or follow-up. A factor analysis identified six problem areas, which explain close to 75% of the total variation: Cognitive Skills, Motor/Perception, Emotion/Socialisation/Behaviour, Attention, Literacy Skills and Activity Control. The majority of the children had pragmatic problems, which are associated with some of the core aspects of the ADHD symptoms, especially inattention and impulsiveness. Communication and language comprehension caused these children many more problems than expressive language. Problems of reading and writing were very frequent. IQ-score was associated with maths and reading/writing. Additional items reflecting language skills, in particular language comprehension and pragmatics, were also found in other domains in the FTF, mainly in Executive functions, Learning and Social skills. Problems with language and pragmatics thus seem to be associated with the typical problems with learning and social skills in children with ADHD.

Keywords  ADHD – language impairment – language comprehension – social skills – pragmatics

Introduction
In both ADHD and language impairment, there are a number of different etiological factors. Besides, there is a variability in symptoms across individuals, contexts and situations [24]. ADHD, language impairment, dyslexia, and learning disabilities are commonly found to be comorbid conditions [14]. It is well documented that children with severe language impairments often have additional neuropsychiatric and neurodevelopmental deficits [4, 9, 20, 22, 28]. Since the 1980s, it is known that some of the children with language impairment also have pragmatic problems [5, 21]. Typical pragmatic symptoms, described by Rapin and Allen, are: “very fluent expressive language, severe impairment in the ability to encode meaning relevant to the conversational situation, a striking inability to engage in communicative discourse and impaired comprehension of connected discourse” (21, p 174).

Co-existence of psychiatric problems and problems of language and communication has been reported in many studies [3]. Cohen et al. found that 40% of 380 children aged 7–14 years who were referred to psychiatric services had a language impairment which had not been previously identified [8]. For that reason, speech and language pathologists are recommended to take an active part in the assessment procedures as well as in the intervention phase of children with neuropsychiatric conditions [12].
In an unselected population of children aged 6–11 years, Tirosh and Cohen [25] found a 5% prevalence of ADHD, with 45% having some language problems. Language impairment is more commonly found in children with ADHD than speech disorders [6]. The risk for social difficulties is higher in children with severe language impairment, since these children often have problems with pragmatics [10]. According to Tannock, pragmatic problems in children with ADHD include “difficulties in the appropriate timing and quantity of language within social and learning contexts”. The pragmatic deficits that are associated with ADHD include: “1) excessive verbal output during spontaneous conversations, during task transitions, and in play settings, 2) decreased verbal output and more dysfluencies when confronted with tasks that require planning and organization of verbal responses, as in storytelling or when giving directions, and 3) timing problems in terms of initiating conversation, taking turns, and maintaining or changing topics during conversation”. (24, p. 136 and 137).

In another study [13], teachers identified language problems in three groups of boys: one group with attention problems, one with learning disabilities, and one control group with average achievement in school. Children with attention problems were rated as having significantly more pragmatic problems, manifested as a difficulty in maintaining a conversation, but not in initiating a conversation. They also had more receptive and expressive language problems than the boys with average achievement, but not compared to those who had learning disabilities.

It is difficult to carry out tests in a consistent manner and to make valid and reliable assessments in children with ADHD, especially with a comorbid language impairment. Oram et al. [19] suggested that the core symptoms of ADHD, i.e. inattention, impulsiveness and hyperactivity, might confound the results on language tests, either the total result or only the performance on certain types of tasks. They evaluated the influence of the formal test procedure by comparing the performance of three groups of children: ADHD-only, ADHD + language impairment, and normal controls. Both the children diagnosed with ADHD-only and the normal controls performed significantly better than the children with ADHD + language impairment [19].

Children with a comorbidity of psychiatric problems and language and communication problems have been found to have greater deficits in social processing, compared to children with normal language development, in particular in decoding emotional expressions of other people and social problem solving [7]. In accordance with this, pragmatic skills seem to be closely connected to competence of social perception and social cognition. In peer relations, social competence plays a very important role. Children with problems in language and pragmatic skills are especially vulnerable to, and at risk for, social failure [10].

Different explanations have been proposed for potential underlying factors of problems with language and pragmatics. One of them suggests an underlying deficit in processing capacity, in particular in activities which require a rapid processing of language [4, 16]. Another one suggests that problems in working memory could explain problems in language processing [11].

According to Cohen et al. [9], problems with working memory might also cause some of the core problems of ADHD. Cohen et al. examined working memory in children with ADHD and in children with other psychiatric diagnoses, both with and without language impairment [9]. Children with language problems had more problems with working memory, regardless of psychiatric diagnosis. Working memory deficits were found to be more closely associated with language impairment than with ADHD. In another study [18], children diagnosed with ADHD plus DCD (Developmental Co-ordination Disorder) were found to have significantly lower ability in discriminating multi-syllables compared to children with ADHD without DCD as well as to age-matched controls. A constraint on working memory was suggested as a possible explanation.

Barkley [2] interprets the difficulties of children with ADHD as emanating from a deficit in behavioural inhibition or self-regulation and ability to take advantage of inner speech in order to behave according to rules and instructions. The assumption of a defective behavioural inhibition has become a current view of ADHD and has had an impact on new intervention programmes focussing on pragmatics and meta-cognition. Examples of self-regulatory behaviour are the ability to organise, plan, monitor and evaluate one’s own behaviour [27].

The aims of this study are: (1) to investigate the types and occurrences of parental reported speech, language and communication problems in a group of children with ADHD, and (2) to explore the relationship between ADHD and language impairment by analysing the importance of language skills in other domains/subdomains of the questionnaire FTF.

**Methods**

**Participants**

The study group consisted of all patients (63 boys and 13 girls, mean age 11 years) diagnosed with ADHD, who were offered stimulant medication, during the years 2000–2002 at the Neuro Psychiatric Team, which was part of a general Child and Adolescent Outpatient Clinic. The catchment area consisted of a small university town with surrounding rural areas. More than half