Research in Developmental Disabilities 33 (2012) 1395–1407

Contents lists available at SciVerse ScienceDirect

Research in Developmental Disabilities

Narrative competence and *internal state language* of children with Asperger Syndrome and ADHD

Anna-Lena Rumpf [a,1], Inge Kamp-Becker [a,1,*], Katja Becker [b], Christina Kauschke [a]

[a] Department of German Language Studies, Clinical Linguistics, Philipps-University Marburg, D-35032 Marburg, Germany
[b] Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, Philipps-University Marburg, D-35033 Marburg, Germany

ARTICLE INFO

Article history:
Received 15 February 2012
Received in revised form 28 February 2012
Accepted 5 March 2012
Available online 21 April 2012

Keywords:
Autism spectrum disorders
Narrative competence
Internal state language
Theory of mind
Weak central coherence
Asperger Syndrome
ADHD

ABSTRACT

The central question of the present study was whether there are differences between children with Asperger Syndrome (AS), children with attention deficit hyperactivity disorder (ADHD) and healthy controls (HC) with respect to the organization of narratives and their verbalization of internal states. Oral narrations of a wordless picture book produced by 31 children (11 with AS, 9 with ADHD, 11 HC, aged 8–12) were analyzed regarding the following linguistic variables: story length, sentence structure and sentence complexity, coherence and cohesion of the stories, verbalization of the narrator's perspective, as well as *internal state language* (verbal reference to mental states). Considerable similarities were noted between the two clinical groups, which deviate from HC children. Narratives of the children with AS and ADHD were shorter than the narratives produced by the HC children. The children of both clinical groups failed to point out the main aspects of the story. In particular, children with AS did not refer to cognitive states as often as the other groups. With respect to narrative coherence, they produced fewer pronominal references than HC children and children with ADHD. In conclusion, the two clinical groups differed from the HC group on a number of features, and a less frequent reference to cognitive states was identified for the children with AS.

1. Introduction

1.1. Autism spectrum disorders and ADHD

Autism spectrum disorders (ASD) are complex neurodevelopmental disorders characterized by marked deficits in three domains: social interaction, communication and repetitive, stereotyped behavior (American Psychiatric Association, 1994). Linguistic impairments are frequently involved in ASD (Geschwind, 2009; Kanner, 1943; Kjellmer, Hedvall, Fernell, Gillberg, & Norrelgen, 2011; Paul, Chawarska, Cicchetti, & Volkmar, 2008; Skovgaard et al., 2008; Tager-Flusberg & Caronna, 2010; Tager-Flusberg, Paul, & Lord, 2005; Tager-Flusberg et al., 2009). These impairments refer to phonology, semantics, syntax and pragmatics. Whereas phonology deals with the perception and production of sound units whose concatenation generates words, semantics deals with the meaning of lexical items, syntax with the structure of words in sentences, and pragmatics with the conventions and rules governing the use of language for communication (Groen, Zwiers, van der Gaag, & Buitelaar, 2008).

* Corresponding author. Tel.: +49 6421 2866469; fax: +49 6421 2863078.
E-mail address: kampbeck@med.uni-marburg.de (I. Kamp-Becker).
[1] Joint first authors.

0891-4222/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
doi:10.1016/j.ridd.2012.03.007

Currently, there is a lively debate about the similarities and differences between ASD and ADHD (Gargaro, Rinehart, Bradshaw, Tonge, & Sheppard 2011; Goldstein & Schwebach, 2004; Holtmann, Bolte, & Poustka, 2007; Mulligan et al., 2009; Nijmeijer et al., 2010; Nyden et al., 2010; Rommelse, Franke, Geurts, Hartman, & Buitelaar 2010; Rommelse, Geurts, Franke, Buitelaar, & Hartman 2011; Sinzig & Lehmkuhl, 2007). ADHD, one of the most common neurodevelopmental disorders, is characterized by symptoms of inattention, and/or hyperactivity and impulsiveness, which must be present before the age of seven (American Psychiatric Association, 1994). In an overview, Rommelse et al. (2011) demonstrated that in clinical samples, between 20% and 50% of children with ADHD met criteria for ASD and between 30% and 80% of ASD children met criteria for ADHD. While the diagnostic guidelines highlight social deficits as especially evident in ASD, the cardinal symptoms of ADHD are deficits in attention and impulsivity as well as, in many cases, increased hyperactivity (Adrien et al., 1993; American Psychiatric Association, 1994). However, a critical number of subjects diagnosed with ASD are found to show deficits in their attention function (Frazier et al., 2001; Goldstein & Schwebach, 2004; Leyfer et al., 2006; Sinzig, Morsch, & Lehmkuhl, 2008), and on the other hand, children with ADHD are frequently found to exhibit social difficulties to a comparable degree to disorders of the autistic spectrum (Clark, Feehan, Tinline, & Vostanis, 1999; Greene et al., 1996; Luteijn et al., 2000; Mulligan et al., 2009; Santosh & Mijovic, 2004). On the one hand there is a debate about the discrimination of autism and ADHD, on the other hand there is no doubt that a high comorbidity of autism and ADHD exists (Gargaro et al., 2011; Gjevik, Eldevik, Fjaeran-Granum, & Sponheim, 2011; Leyfer et al., 2006; Simonoff et al., 2008), thus, the investigation of differences between the disorders is important.

While some individuals with ASD never develop functional language (Tager-Flusberg & Caronna, 2010), others present a profile of normal IQ, well-developed language form (i.e., phonology, syntax and morphology), and large productive vocabularies. Subjects with Asperger Syndrome (AS) do not have a history of language delay, but they exhibit qualitative impairments of social interaction, play, and communication, as well as intense circumscribed interests or obsessions, and some motor delay and clumsiness (American Psychiatric Association, 1994; Klin, Volkmar, & Sparrow, 2000; Woodbury-Smith & Volkmar, 2009).

First studies regarding the neuronal correlates of linguistic deficits in ASD demonstrate abnormal high-level linguistic processing in the frontal and temporal language association cortices, indicating more self-reliant and less connected neural subsystems (Groen et al., 2008, 2010; Mason, Williams, Kana, Minshew, & Just, 2008). Psychological theories which attempt to explain the linguistic deficits especially in high-functioning ASD are: weak central coherence (WCC) (Frith, 1996; Noens & van Berckelaer-Onnes, 2005) and impaired theory of mind (ToM) and empathy (Baron-Cohen, 2000; Tager-Flusberg, 1999). Central coherence describes the ability to integrate separate pieces of information into meaningful wholes. In relation to autism, the WCC theory postulates a domain-general tendency to favor processing of local stimulus properties due to a reduced ability in processing global context. WCC occurs at both "low" and "high" levels of information processing. Low-level WCC refers to the tendency to neglect context in the sensory (e.g., visual, acoustic) domain, favoring the processing of individual stimulus features, whereas high-level WCC concerns impairments of more abstract contextual processes (Happé, 1996; Jolliffe & Baron-Cohen, 1997; Rondan & Deruelle, 2007). Recent research has demonstrated a reduced ability to infer global meaning from sentences (Booth & Happé, 2010; Lopez & Leekam, 2003) and stories (Nuske & Bavin, 2011), yielding empirical evidence that the WCC accounts for at least the semantic and pragmatic language deficits in ASD. The importance of WCC for social-cognitive processes (Loth, Gomez, & Happé, 2008, 2010) as well as for the symptoms of ASD (Noens & van Berckelaer-Onnes, 2005; Pellicano, 2010; Pellicano, Maybery, Durkin, & Maley, 2006) has also been documented.

ToM refers to the specific cognitive ability to infer other people's mental states and to understand that others have beliefs, desires and intentions that are different from our own (Frith & Frith, 2005). It has been claimed that persons with ASD in part fail to recognize and respond appropriately to the emotional experiences of others (Baron-Cohen & Wheelwright, 2004; Gauthier, Klaiman, & Schultz, 2009; Golan, Baron-Cohen, & Hill, 2006). Gillberg (1992) described autistic disorders as "empathy disorders", stressing the relevance of this specific deficit in the emotional domain. It has been suggested that many aspects of the observed problems in social interaction can be explained by an ASD-specific deficit in ToM (Baron-Cohen, 2000). Even ASD subjects with high cognitive abilities show impairments in various tasks with ToM demands (Happé, 1994; Senju, Southgate, White, & Frith, 2009). Some studies have also demonstrated that performance on ToM tasks, such as the false belief task, are closely related to language ability (Happé, 1994; Tager-Flusberg, 1999; Tager-Flusberg & Caronna, 2010). The deficits in ToM are also important in the interpretation of the language and communicative impairments in ASD (Tager-Flusberg, 1999).

1.2. Internal state language

In order to communicate about feelings, desires, beliefs, intentions and other internal states, adequate linguistic devices are required. Linguistic expressions that refer to these internal and mental states of the speaker or of others are subsumed under the term *internal state language* (ISL, Bretherton & Beeghly, 1982). ISL covers all verbal expressions of internal and/or mental states concerning the self or others. Terms describing internal states can be classified into the following subgroups: emotion (e.g., "anger, sorrowful, lucky"), cognition (e.g., "thinking, wondering"), evaluation (e.g., "good, bad, nice"), modality (e.g., "have to, can, should"), physiology (e.g., "hungry, tired"), and affective particles (e.g., "actually, maybe") (Kauschke & Klann-Delius, 1997), which convey the speaker's perspective towards the reported events.