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Performance of children with social communication disorder on the Happé Strange Stories: Physical and mental state responses and relationship to language ability

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ABSTRACT

This study investigated whether a modified scoring method was useful for examining the ability of children with social communication disorder (CwSCD) to understand non-literal language and use mental state responses on the Happé Strange Stories (HSS) task. CwSCD and a control group of children with typical language development (CwTLD) completed 10 of the original HSS. CwSCD scored significantly lower on the HSS task than did CwTLD and were much less likely to produce mental state responses. There was a high level of inter-rater reliability (Weighted Kappa = 0.907) across data from both groups. HSS performance and language ability correlated significantly for CwSCD. A regression model with age, nonverbal intelligence, receptive and expressive language as predictors explained 55.2% of the variance in HSS ability for CwSCD. The results suggest that the HSS have potential to be used as a clinical assessment to investigate high-level language and ability to infer intent in CwSCD.

Learning outcomes: Readers will be able to describe a modified scoring method for the Happé Strange Stories task. Readers will be able to identify areas of impairment for children with social communication disorder. Readers will identify how these areas of impairment have an effect on ability to understand non-literal language and produce mental state responses on the Happé Strange Stories task.

1. Introduction

'Social (pragmatic) communication disorder' (SCD) is defined in the DSM-5 (American Psychiatric Association, 2013) as a persistant difficulty in both language development and pragmatic development, that is present from early childhood, with the absence of restrictive and repeititve behaviours. Children with social communication disorder (CwSCD) have poorly developed conversational skills and problems interpreting non-literal language as well as difficulties understanding and

Abbreviations: ASD, autism spectrum disorder; CwSCD, children with social communication disorder; CwTLD, children with typical language development; HSS, Happé Strange Stories; PLI, pragmatic language impairment; SCD, social communication disorder; SLI, specific language impairment; ToM, theory of mind; TLD, typical language development.

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producing narratives (Adams & Bishop, 1989; Bishop, 2000; Bishop & Adams, 1989; Bishop, Chan, Adams, Hartley, & Weir, 2000; Botting, 2002; Botting & Adams, 2005; Kerbel & Grunwell, 1998; Norbury & Bishop, 2003). They have inferencing difficulties (Adams, Clarke, & Haynes, 2009) and sometimes make bizarre or unusual inferences (Leinonen & Letts, 1997; Volden & Lord, 1991).

SCD is a heterogeneous condition in terms of both the pattern and severity of social communication and language skills. Children present with some features of both autism *and* language impairment (Bishop, 2000). For example, some CwSCD show receptive and expressive language difficulties which are also present in children with specific language impairment (SLI). There are also overlaps between CwSCD and high functioning children who have autism spectrum disorders (ASD) in terms of pragmatic characteristics. For example both groups may use stereotypical phrases, inappropriate intonation and have impaired non-verbal interaction skills (Landa, 2000). However SCD can be distinguished from ASD because CwSCD do not show restrictive and repetitive behaviours (Bishop, 1998; Leyfer, Tager-Flusberg, Dowd, Tomblin, & Folstein, 2008).

SCD has previously been referred to as pragmatic language impairment (PLI) (Bishop, 2000) or semantic-pragmatic syndrome (Rapin & Allen, 1983). PLI was defined in children who show a disproportionate difficulty with the pragmatic aspects of language compared to relative strength in their structural language abilities (grammar and phonology) (Bishop, 2000). The term SCD reflects current terminology and seems to be a more appropriate label for this group as their difficulties extend beyond pragmatics into other areas of social interaction and communication. Therefore in the present study, the term 'children with social communication disorder (CwSCD)' will be used to describe children with a pattern of pragmatic and social communication needs similar to those described by the SCD profile in the DSM-5 (American Psychiatric Association, 2013) and as PLI by Bishop (2000).

Despite the availability of many standardised tests of language, relatively few address children's high-level language skills including understanding of narrative, inference skills and non-literal language comprehension (Adams, 2002). This is important for identification of these difficulties and the design of appropriate intervention for these children. The present study therefore explores whether the Happé Strange Stories (Happé, 1994) would be clinically useful to assess some of these higher level language skills in CwSCD.

Francesca Happé created the "Strange Stories" task as a theory of mind (ToM) assessment, specifically to tap into the ability of people with autism to provide context-appropriate mental state explanations for non-literal utterances. Each Strange Story consists of a verbally presented narrative with a non-literal statement which has to be interpreted correctly in context in order to both understand the underlying message of the story and to respond to questions asked after the story is completed. The Happé Strange Stories (HSS) content focuses on non-literal uses of language such as lies, white lies, misunderstanding and sarcasm. Happé (1994) found that individuals with autism who had passed first order false belief tasks performed significantly worse on HSS than control groups (typically developing adults and children and individuals with learning disability). She suggested that the HSS battery has the potential therefore to be a "more sensitive and naturalistic test of theory of mind ability" (p. 144) than traditional false belief tasks since it reflects typical social interactions more closely. As with other ToM tasks, the HSS task requires the use of inferencing skills, that is, inferring the speaker's non-literal intent in a particular social context. Therefore CwSCD are an interesting group in which to explore performance on HSS given their difficulties with above-sentence level language tasks including comprehension of non-literal language, narrative organisation and inferential comprehension (Botting & Adams, 2005).

In her original scoring method, Happé (1994) scored answers as correct if they provided a factually correct and appropriate inference. An answer was marked as incorrect if it contained an error about the facts given in the story or if it contained an inappropriate inference as the explanation for the character's utterance. Happé also made a distinction between physical and mental state responses. Happé defined a mental state answer as one that referred to 'thoughts, feelings, desires, traits, and dispositions'. These answers 'included terms such as like, want, happy, cross, afraid, know, think, joke, pretend, lie, to fool someone' (p. 135). This description refers to responses which demonstrate first order ToM and that the participant is inferring intent and has used metalinguistic skills. Happé coded responses as physical state when they 'referred to nonmental events – physical appearance, action of objects, physical events, and outcomes' (p. 135). A physical response was coded for answers that did not demonstrate any inferential content. For example a response that is literal or re-states factual information already depicted in the story.

Scoring of HSS has been explored beyond the initial scheme used by Happé (e.g. O'Hare, Bremner, Nash, Happé, & Pettigrew, 2009) and it is now desirable to develop this procedure further. O'Hare et al. (2009) studied HSS performance in children with typical language development (CwTLD) aged between 5 and 12 years. The normative data provided by this study showed that there were no gender differences on the task and that the stories discriminated performance across different age bands. O'Hare et al. (2009) applied a numerical scheme to Happé's scoring system and distinguished between a 'partial' mental state answer which was given a score of 1, and a 'full and accurate' mental state answer which was given a score of 2. In contrast to Happé, O'Hare et al. did not give any credit for 'physical state' responses as they argued that citing physical events or outcomes was 'no more accurate than one who states that they don't know' (O'Hare et al., 2009, p. 918).

Use of an instrument such as HSS is of considerable interest to speech and language therapists working with CwSCD because it provides a valuable opportunity to tap into high-level language understanding and social reasoning. A reliable coding scheme for HSS responses is therefore desirable and normative data are needed for comparative purposes. To be clinically useful and applicable to a language impaired population, a numerical scoring scheme is required that codes both physical and mental state responses to HSS. Whilst a physical response does not show non-literal understanding it does demonstrate at least some literal or linguistic understanding. This information would be useful clinically as literal