Critical Review:
In school-aged children with Autism Spectrum Disorder (ASD), what oral narrative elements differ from their typically developing peers?

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The following literature review examined evidence to determine what narrative elements differ in the stories of school-aged children with Autism Spectrum Disorder (ASD) when compared to their typically developing (TD) peers. A literature search provided seven studies of relevance, all with between groups nonrandomized clinical trial study designs. Overall, findings suggest that the narratives of children with ASD include lower microstructure and macrostructure elements that contribute to less coherent and cohesive stories. Clinical implications are discussed.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by impaired social use of language, social functioning, and restrictive/repetitive behaviours (American Psychiatric Association in Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition -DSM-V, 2017). Heterogeneity exists within the disorder but common symptom expression includes impairments in language discourse skills, including narratives or storytelling (Losh & Gordon, 2014).

Narratives provide a context for social interactions and relationships. Storytelling abilities have been associated with reading development and overall academic success (Hilvert, Davidson, & Gámes, 2016). The ability to construct a narrative relies on a range of linguistic, cognitive, and social abilities (King, Dockrell, & Stuart, 2013). A narrator must be able to effectively introduce the story, organize information to plot events, supply necessary contextual and referential information in a cohesive manner while using grammatical structures, marking causal and temporal relations, in addition to attributing the thoughts, emotions, and intentions of story characters (King, Dockrell, & Stuart, 2013). Previous narrative research has identified that by the age of nine, typically developing (TD) children are able to construct a narrative utilizing the aforementioned skills (Berman 1997; Karmiloff-Smith, 1985). Considering that impaired social communication is a core feature of ASD, these skills may be compromised during the production of their narratives.

Narratives can vary in type (i.e. personal event, fictional, conversational, auto-biography) and modality (i.e. oral, written, non-verbal). There are various methods of evaluating narrative skills such as story generation or story retell tasks, which require different cognitive demands on the narrator. Telling a story using a picture book provides visual and sequencing support to the storyteller. In contrast, a personal event narrative requires the storyteller to remember, organize, and sequence information on their own. Furthermore, retelling or recalling a story requires the retrieval of information from episodic memory. Research suggests that episodic memory may be impaired in individuals with ASD (Boucher & Mayes, 2011) however, semantic memory is thought to be intact (Crane & Goddard, 2008). Such memory differences might lead to different performance decrements based on the demand of the narrative task for individuals with ASD. Therefore, analysis of different narrative types can provide insight into how the impairments of ASD are reflected in their storytelling abilities when compared to TD peers.

Objectives

The objective of this paper is to critically evaluate a series of research findings to determine how the narratives of children with ASD differ from their TD peers.

Methods

Search Strategy: A search strategy was employed in the following computerized search engines to locate studies included in the current critical analysis: Scholars Portal, PubMed, ScienceDirect, and Sage Journals. Studies were limited to those written in the English language and published between 1990 and 2017. The following key words were also used to narrow the results returned in the database search: [("Autism Spectrum Disorder" OR "ASD") AND ("narrative" OR "story generation")].

Selection Criteria: Studies that met the following inclusion criteria were selected for review: participants were school-aged children with ASD diagnosis

according to the *Diagnostic and Statistical Manual of Mental Disorders -Fifth Edition (DSM-V),* inclusion of a TD comparison group, and performance measures on an oral narrative productive task, regardless of the type of narration. The inclusion of different narrative types was intended to encompass the diversity of characteristics displayed in narratives produced by children with ASD. With the inclusion criteria applied, seven studies were selected.

Data Collection
All selected articles implemented a nonrandomized clinical trial study design which was determined to be an appropriate design for the question being addressed.

Results

Although randomized clinical trials are considered to be the gold standard for research design, this type of study required that one group contain only individuals with ASD and the other group contain only TD individuals.

Losh and Capps (2003) conducted a between groups nonrandomized clinical trial design to evaluate the narrative abilities of children with high functioning ASD to TD children. Comparison groups were matched on chronological age and verbal IQ. Narrative skills were measured across two different discourse contexts; storybook and personal narratives. Prompting was limited to clarification or elaboration requests. The authors analyzed grammatical, evaluative, and structural aspects of the stories from both contexts. Theory of Mind (TOM) and emotional understanding was also assessed.

Appropriate statistical analysis revealed that children with ASD produced narratives with less complex syntax in their personal narratives than in their storybook narratives. The children with ASD were observed to be highly dependent on experimenter support when they had to construct personal stories in an open-ended context. In addition, they used limited causal language both within and across both narrative contexts. Furthermore, the narrative abilities of the children with ASD were associated with their performance on measures of emotional understanding, not their TOM or verbal IQ.

Overall, the Losh and Capps (2003) study provided level two evidence with suggestive results indicating that children with ASD produce storybook and personal narratives that are less syntactically complex, include less causal language and require more support for open-ended story contexts when compared to their TD peers.

King, Dockrell, and Stuart (2013) investigated the narrative abilities of children with ASD in their production of general (script routine events) and specific (personal) event narratives. Using a between groups nonrandomized clinical trial design, children with high functioning ASD were matched with two comparison groups; one on chronological age and the second group was matched on expressive language and non-verbal ability. The participants recruited included children as young as five years old.

Two narrative tasks were designed to elicit a general and specific story from each participant. Narratives were analyzed for structural (length, MLU, number of different word roots, and use of mazes) and evaluative measures.

Appropriate data analyses revealed that the narratives of the ASD children differed from TD children in structure, producing shorter stories with fewer word roots, and smaller MLUs. They also differed in evaluative language measures, with fewer causal statements and mental state references. However, ASD narratives contained fewer mazes than both comparison groups, indicating that although their narratives were relatively weak in certain areas, they were orally more fluent than both groups, with fewer repetitions and revisions.

King et al. (2013) indicated that the narratives of the ASD children reflected difficulties with TOM and executive functions. However, the authors did not evaluate these factors in their methodology and procedures, therefore they speculated without measuring.

This study offers level two evidence and provides moderately suggestive validity due to study limitations but an overall strong clinical importance.

In a later study, **King, Dockrell, and Stuart (2014)** also evaluated whether fictional narratives of children with ASD differed from TD children. Using a between-groups nonrandomized clinical trial design, children with high functioning ASD were matched with two comparison groups; one group was matched on chronological age and non-verbal ability, the second group matched with a younger group of TD children on expressive language and non-verbal ability. The participants recruited included children as young as five years old.

The methodology of the study was complete. Fictional narratives were elicited when participants were presented two story stems with picture support and asked to continue the story. Stories were analyzed on

structural and evaluative measures (number of main body words, MLU, number of word roots, references to mental states, and causal statements) and global structure measures (introduction, character, mental states, referencing, conflict resolution, coherence, and conclusion).

Appropriate data analyses were conducted and revealed that the narratives of the children with ASD differed from those of TD children on global features (macrostructure) and local features (microstructure). ASD narratives were shorter in length containing fewer causal statements with less grammatically correct sentences. Their stories were lower in the categories of introduction, character development, mental states, conflict resolution and coherence. The differences in the narratives reflected deficits in TOM and executive functioning.

Although this study offers level two evidence, the overall results are moderately suggestive due to study limitations. However, the clinical importance of the study is compelling. This study, provides support for the notion that children with ASD construct fictional narratives focusing on the details of the story rather than its global whole.

Losh and Gordon (2014) investigated the narrative abilities of children with ASD and TD children on two narrative tasks: story generation and story recall. A between groups nonrandomized clinical trial design was implemented comparing high functioning children with ASD to TD controls who were matched on chronological age and verbal IQ. Detailed study inclusion criteria was provided with a complete methodology of the study.

Narratives for the story generation task were elicited using a wordless picture book. Narratives for the story recall task were elicited using two oral fairy tale texts read aloud to the participants simultaneously with puppet demonstration. Narratives were analyzed based on semantic similarity.

The Latent Semantic Analysis (LSA) was used as a qualitative tool to compare the semantic similarity among narratives. Story generation analyses for semantic similarity could not be performed because there is no original text to the wordless picture book. Therefore, four narratives that were the most similar from control subjects were selected to be used as the standard. This cannot be reliably determined or a generalized standard to the larger population of TD children, which weakens the study results. Although *t*-tests and correlations were conducted appropriately, an ANOVA calculation should have been performed to compare the narrative variables between and within groups for an accurate comparison of the differences, which creates another limitation in the data analyses. The validity of the LSA tool was assessed by examining the frequency of experimenter prompting, use of evaluative devices, and complex syntax.

Results revealed that semantic similarity was similar across groups in the story generation task. However, in the story recall task, the ASD narratives diverged significantly from the mean of semantic content of the original story told. Furthermore, without picture support, children with ASD produced narratives with many off-topic and irrelevant comments, which caused incoherent stories that deviated from the original theme.

Overall, the Losh and Gordon (2014) study provided level two evidence with highly suggestive validity due to study limitations, but compelling clinical implications supporting the importance of visual support for children with ASD when constructing oral narratives.

Siller, Swanson, Serlin, and Teachworth (2014) examined the differences in the use of internal state language (ISL) in narratives and the relation between children's ISL and their TOM abilities. A between groups nonrandomized clinical trial design was used comparing children with ASD and TD controls matched on gender, IQ, receptive and expressive vocabulary. Age was not a considered factor of comparison between the groups. Additionally, the participants recruited included children as young as six years old.

The methodology of the study was detailed and complete. Narratives were elicited using two wordless picture books. These stories included contexts of deception and evoked emotional states from the protagonists. Prompting was limited to clarification or elaboration requests. Narratives were analyzed based on narrative volume, and use of ISL. TOM was evaluated.

Appropriate statistical analyses were conducted and revealed that the ASD stories had a lower narrative volume and were less likely to reference characters' emotions than TD controls. In addition, there was a specific association between children's use of emotion terms and their TOM abilities, but no group differences in the use of cognitive terms in their narratives.

This study offers level two evidence with highly suggestive results due to study limitations, but strong clinical importance that provides support that ASD children produce narratives that contain limited ISL which could be attributed to deficits in their TOM abilities.

Hilvert et al. (2016) investigated the script and non-script based narrative abilities in children with ASD using a between groups nonrandomized clinical trial design to compare them to TD controls. Comparison groups were matched on non-verbal reasoning and receptive vocabulary. Age was not a considered factor of comparison between the groups. Additionally, the participants recruited included children as young as six years old.

Two different story retelling tasks were used to elicit a script-based narrative and a non-script based narrative. Narratives were analyzed on their microstructure, overall narrative coherence, cohesion, and inclusion of script and non-script details. TOM and receptive vocabulary were also assessed.

Appropriate statistical analysis were conducted and results revealed that children with ASD demonstrated lower narrative production in terms of micro- and macrostructure on both script and non-script based stories. ASD narratives included the same number of script details as TD children, but were less likely to include non-script details. Their stories were less syntactically and semantically complex, cohesively linked, and coherent when compared to TD controls. TOM ability predicted narrative coherence and cohesion in children with ASD.

Although this study offers level two evidence, the overall results are highly suggestive due to study limitations. However, the clinical importance is compelling, providing support that children with ASD construct non-cohesive and non-coherent script and non-script narratives that can be associated with their deficits in TOM abilities.

Novogrodsky and Edelson (2016) examined the pronoun production and syntactic abilities in narratives produced by children with ASD. Using a between groups nonrandomized clinical design, children with ASD were matched with TD controls on age and verbal cognitive abilities. However, cognitive scores were not available for 20% of the ASD children. Additionally, the participants recruited included children as young as five years old.

Narratives were elicited using a story generation and story retell task. Stories were analyzed on syntactic features, and pronoun production.

Appropriate statistical analyses were performed and revealed no difference between groups on the story retell task. However, on the story generation task, children with ASD produced narratives that contained more ambiguous pronouns and more agreement errors in their pronoun production compared to the TD controls.

This study offers level two evidence with moderately suggestive results due to study limitations. However, the clinical importance is compelling, providing support that children with ASD construct narratives with more ambiguous pronouns compared to TD children.

Discussion

The current literature review examined the narrative abilities of children with ASD in comparison to TD peers. All seven studies reviewed implemented a between groups nonrandomized clinical trial design, thus providing level two evidence which allowed for a more accurate comparison to be made between the studies.

Evidence from the studies reviewed indicated that the narratives of children with ASD differed from TD peers regardless of narrative type or method of evaluation. Common characteristics of ASD narratives included limited causal language, fewer references to mental states, and overall poor story coherence (Losh & Capps, 2003; King et al. 2013, 2014; Losh & Gordon, 2014 and Siller et al. 2014). Four of the studies reviewed found a holistic perspective in ASD storytelling, where their constructed narratives focused more on the details of the story rather than global elements (King et al. 2013, 2014; Hilvert et al. 2016; and Siller et al. 2014). This, supported evidence by King et al. (2014) who indicated that ASD narratives were lower in macrostructure elements such as introduction, character development, conflict resolution and overall story coherence. Compelling clinical evidence was presented by Losh and Gordon (2014), who found that story cohesion in ASD narratives was affected when picture support was not available, which resulted in the production of off-topic and irrelevant additions to their stories. King et al. (2014) provided strong evidence that ASD narratives demonstrated lower structural and evaluative elements compared to TD controls, such as shorter story length, fewer word roots, and smaller MLUs. This coincides with other studies reviewed (Losh & Capps, 2003; King et al. 2013; and Hilvert et al. 2014) that indicated ASD narratives were less syntactically and semantically complex. However, patterns across these findings depend on type of narrative and method of evaluation.

A recurrent limitation was observed across five of the studies reviewed (King et al. 2013, 2014; Siller et al. 2014; Hilvert et al. 2014; and Novogrodsy & Edleson, 2016) was that children as young as five years old were recruited to participate in the studies. Previous research

has identified that typically developing children are able to construct a narrative by the age of nine (Berman 1997; Karmiloff-Smith, 1985). Therefore, the inclusion of younger children weakened the reliability of the results in these studies. In addition, there were two studies that did not match the comparison groups by age (Siller et al. 2014; and Hilvert et al. 2016) and two studies who did not assess TOM and executive functions (King et al. 2013, 2014). The researchers speculated on these factors without measuring, when these higher order skills have been identified in previous research as important skills needed for storytelling (Astington, 1991). Therefore, the exclusion of these factors weaken the reliability of the results of those studies in terms of generalization to the ASD population.

Conclusion

Overall, a diverse representation of narrative types (fictional stories, personal events, script, and non-script based narratives) and methods of evaluation (story generation, story retell) were present in the studies reviewed in order to evaluate the narrative profile of children with ASD. The results are compelling and clinically relevant towards the deficits in ASD narratives. However, given issues with validity and reliability, the findings must be interpreted with caution.

The oral narrative elements that differed in ASD children compared to TD controls included shorter stories with lower syntactic and semantic complexity, lower macrostructure elements with less coherent and cohesive stories, and fewer references to cognitive and emotional states.

Clinical Implications

Clinicians working with children with ASD should be aware of the difficulties that influence oral narrative production such as expressive language skills, TOM, and executive functions. These highlight the need for targeted intervention in specific aspects of narrative language and confirm the importance of developing oral language skills.

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