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Research Project Title
Narrative abilities in children with Autism Spectrum Disorder (ASD)

Aims
- To explore narrative abilities in children with Autism Spectrum Disorder (ASD) as compared to children with typical development, with a particular focus on measures of coherence and macrostructure, comparing performance on more and less structured narrative tasks.
- To investigate scaffolding/cueing that supports children with ASD to improve their performance on more difficult narrative tasks.

Background
Narrative skills are the primary means by which we make use of our language abilities in everyday life and have been found to be an important factor in educational attainment (e.g. Petersen et al, 2011) and social interaction (e.g. von Klitzing et al, 2007; Johnston, 2008).

The education system in the UK places central importance on written and spoken narrative, as evidenced by the National Curriculum for English (Department for Education, 2013), which states several narrative-related milestones that children are expected to meet over the course of their years at school:
- By age 7 – retell stories and traditional tales; write narratives about personal experiences and those of others.
- By age 11 – summarise and present familiar stories in their own words; give well-structured descriptions, explanations and narratives; describe settings, characters and atmosphere
- By age 14 – give short speeches and presentations; write for a range of purposes and audiences, including well-structured formal expository and narrative essays, stories, scripts, poetry and other imaginative writing
- By age 16 – write clearly, accurately and coherently....: to describe, narrate, explain, instruct, give and respond to information, and argue; write formal and academic essays as well as writing imaginatively.

Meeting these expected standards is difficult for children who have communication impairments, including those with ASD. The difficulties experienced by these children can cause significant difficulties with meeting the above milestones, which can impact on academic attainment, not only in English, but also in other subjects. Evidence also suggests that individuals with ASD are more likely to encounter the criminal justice system (Turcotte et al, 2018), and there is therefore a need to understand their ability to give evidence via eyewitness narratives, and how this can best be supported.

Research evidence on narrative ability in children with ASD is mixed, with some studies finding differences from typically developing children, and others showing that children with ASD display comparable levels of narrative skill. A meta-analysis by Baixauli et al (2016), based on the results of 24 studies, found that, overall, children with ASD showed poorer levels of competence than children with typical development across both microstructure (number of utterances, length of utterances, syntactic complexity) and macrostructure (measures of coherence and cohesion than capture the structure of a narrative and the related-ness of the information within the narrative). However, the authors of this meta-analysis acknowledged significant heterogeneity in the results from individual studies, with some research groups
finding that groups of autistic and typically developing children did not differ significantly on measures of coherence when using wordless picture books (e.g. Kauschke et al, 2016; Kuijper et al, 2017); story retelling (e.g. Bishop & Norbury, 2003; Diehl et al, 2006), or narrative recall of witnessed events (Henry et al, in press). However, other studies have found lower macrostructure scores for children with ASD using very similar measures (e.g. Suh et al, 2014; Norbury et al, 2014; Banney et al, 2015; Peristeri et al, 2017). Many of these previously studied samples have been small in size and the inconsistency in results is not yet reconciled.

This inconsistency in results is possibly caused by variations in the narrative tasks used, which can be more or less structured, and therefore possibly more or less difficult for individuals with ASD relative to those with typical development. For example, Losh & Gordon (2014) found that children with ASD performed below the level of those with typical development only on a more demanding narrative task, where the children were required to retell a story they had heard without prompts to help them remember how to structure the story. In a wordless picture book condition, where children were asked to narrate a story they could see in pictures (which provided both a memory aid and a structure for the story), the children with ASD performed at the same level as the typically developing children in terms of macrostructure measures. Similarly, Hilvert et al (2016) attempted to capture differences between children with ASD and typically developing children on retelling tasks using both a scripted story based on events the child ren were likely to have experienced in everyday life, and a non-scripted story about an occurrence which was likely to be novel. Again, this study showed differences in coherence scores between children with ASD and those with typical development only on the more complex task (the non-scripted story). This evidence is suggestive of a need to consider properties of the task that may facilitate the telling of narratives in children with ASD, and identify more specifically the narrative tasks on which they perform below the level of typically developing children, and those on which their performance is relatively stronger.

It is also possible that some variability in results may be explained by the different matching procedures that research groups have used, which typically include age and IQ, but vary in the extent to which they match on or consider structural language ability, which is also needed for the production of narrative. It is therefore hoped that testing a range of narrative tasks, on a scale of most to least structure, within the same sample, will overcome some of these difficulties and demonstrate on what types of narrative tasks autistic children can perform as capably as typically developing children, and on which they have more difficulty. This is important information for teachers and therapists working with children with ASD, as developing their narrative skills in weaker areas may have both educational and social implications, as described above.

In addition, where previous research suggests that children with ASD perform below the level of typically developing children in narrative tasks, it is not known how best to facilitate these children to develop their narrative competence. This because most assessment tasks use “static” methods to capture performance at one point in time. However, there is growing evidence that dynamic assessment, within which the child is facilitated to reach their optimum level of performance on a task, may be useful within speech and language therapy (e.g. Hasson & Joffe, 2007) and education, in order to highlight which cueing strategies are most useful for learners. This is also important information for those working to improve narrative competence.
**Methodology**

Since many studies to date have included small groups of less than 20 participants each, the aim would be to recruit larger groups, in order to address some of the difficulties with interpreting previous results. As many previous studies have not differentiated between children with ASD and typical-range language skills, and those with ASD plus language impairments, the idea would be to recruit a larger group of children with ASD, so that the impact of language skills on narrative performance within the population with ASD can be investigated. The proposed project would therefore aim to recruit a total of 40 children with ASD, of whom half have typical-range structural language skills and half have language skills in the impaired range. A comparison group of 40 typically developing children matched for age and non-verbal IQ would also be recruited. Children would be recruited through schools in the Greater London area, including schools which have additionally resourced provision for children with ASD. Headteachers of schools would be contacted to seek support for the study, in terms of identifying pupils who may be able to participate, sending information and consent forms home to parents, and providing space within the school for children to carry out assessment. Typically developing children would be recruited from schools within the same geographical area, in order to control for effects of socio-economic status. As the majority of the literature has focused on children aged 6-11 years, this age range would also be targeted for the proposed project.

Children will be assessed on non-verbal cognitive measures (Raven’s Coloured Progressive Matrices) and language tasks (CELF-5) in order to gather background information for the study. Some previous work has found working memory measures to be related to narrative ability, so working memory tasks would also be administered during this initial assessment, to allow for the control of this variable in statistical analysis. For the main experimental measures, children would be administered narrative tasks that fall along a hierarchy from more to less structured. Examples of highly structured narrative tasks include story generation from wordless picture books or story retells where pictures are available to the child, providing some of the story structure and thus potentially lowering the cognitive demands. Recall of a story or event without pictures to support memory or the framework of the story would be a more complex and less structured task, and it could be hypothesised that this would therefore be more difficult for children with ASD; however, the model provided by the event or the original telling of the story still provides a level of structure for the child to use in their response. By contrast, narrative tasks with limited structure could include story generation from a picture, or starter sentence, where the child must create a structure for their answer without a model. In all cases, narratives would be recorded and transcribed, and then analysed for macrostructure elements, using a story grammar framework, which analyses how many key story elements the narrative contains, and therefore provides a measure of how coherent the story will appear to a listener.

Following analysis of this original dataset, dynamic assessment (DA) will be used to explore in more detail the narrative tasks on which children with ASD have weaker performance than typically developing children. Unlike traditional methods, DA involves mediation within the process of assessment, and measures the amount and type of cueing needed for a child to achieve success on a task. As it could be hypothesised based on the previous literature that the less structured tasks would be the most difficult for children with ASD, a cueing framework that gradually provides more structure to enable children to complete the task will be devised and then tested on the same sample, in order to evaluate the effects of this mediation on task performance. It is hoped that this information will be of substantial clinical relevance for the remediation of narrative deficits by both speech and language therapists and teachers and help to develop interventions which can help children with ASD to improve their narrative skills.
Outcomes

This project will lead to publications in peer reviewed journals and presentations at academic conferences. It is also hoped that findings can be disseminated to a wider audience, via publications aimed at SLTs and teachers, and possibly through a professional development event that SLTs and teachers can attend to learn about the findings of the study, and how they can use these findings to improve their support of children with ASD in SLT sessions and in the classroom.

Importance/Impact

This study would contribute to the existing literature on narrative in ASD in several ways, including a larger sample size, greater ability to evaluate the role of language in narrative ability in ASD and a comparison of several different types of narrative task within the same sample, in order to fully evaluate the areas of narrative in which children with ASD are as capable as their typically developing peers, and those in which they have weaknesses. There is the potential for a significant clinical and educational impact in being able to inform SLTs and teachers of which types of narrative tasks children with ASD are likely to find more challenging, and how they can best support their pupils during these tasks.

Outline Timetable

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<tr>
<th>Time Frame</th>
<th>Activities</th>
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<tr>
<td>October 2019 – January 2020</td>
<td>Application for ethical approval</td>
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<td>Begin literature review</td>
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<tr>
<td>February 2020 – April 2020</td>
<td>Literature review and task design</td>
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<td>Recruitment of schools/participants</td>
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<td>May 2020</td>
<td>Pilot Testing</td>
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<td>June 2020 – December 2020</td>
<td>Data collection and data analysis for RQ1</td>
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<td>January 2021 – March 2021</td>
<td>Task design for RQ2</td>
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<td>August 2021 to September 2022</td>
<td>Data analysis for RQ2, writing up</td>
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