

**Oral Narrative Intervention with Children with Autism Spectrum Disorder and  
Language Disorder**

Kate Favot

Masters of Research

Masters of Speech and Language Pathology

Diploma of Education

Bachelor of Arts

Department of Educational Studies

Macquarie University

December 2019

This thesis is presented for the Doctor of Philosophy

## TABLE OF CONTENTS

Table of contents .....	ii
Requirements and format of thesis by publication .....	iii
Summary .....	iv
Statement of originality .....	vi
Statement of candidature .....	vii
Statement of contribution .....	viii
Acknowledgments .....	x
Chapter 1: Introduction .....	1
Chapter 2: The effects of oral narrative intervention on the narratives of children with language disorder: A systematic literature review .....	45
Chapter 3: The effects of an oral narrative intervention on the personal narratives of children with ASD and severe language disorder .....	105
Chapter 4: The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study .....	132
Chapter 5: The effects of an oral narrative intervention on the original fictional narratives of children with ASD and language disorder .....	156
Chapter 6: Conclusion .....	199
Appendix 1: The effects of an oral narrative intervention on the personal narratives of children with ASD and language impairment: A pilot study .....	204
Appendix 2: Ethics approval .....	222

## **Requirements and format of thesis by publication**

A thesis must form a distinct contribution to knowledge either by the discovery of new facts or by the exercise of independent critical power. The thesis as a whole should be focused on a single project or set of related questions and should present an integrated body of work, reflecting a coherent program of research.

A typical thesis by publication typically would include:

- An introductory chapter providing a coherent overview of the background to the thesis, the research questions and the structure and organisation of the remaining chapters. The distinct contribution the thesis should be clearly identified.
- A number of chapters each written in the format of self-contained journal articles. These chapters can be published, in press or in submission ready format. Where articles are published, they do not need to be reformatted for inclusion in the thesis. Each chapter should be prefaced by a brief introduction outlining how the chapter fits into the program of research and, in the case of jointly authored chapters, the student's contribution should be clearly specified.
- A final chapter providing an integrative summary and conclusion, drawing together all the work described in the other parts of the thesis and relating this back to the issues raised in the introduction.

For further details see information refer to the Higher Degree Research website:

<https://students.mq.edu.au/study/my-research-program/before-submission-and-prep>

## Summary

Narratives are temporally sequenced accounts of events and have a broad importance to social, academic and language development. Individuals with autism spectrum disorder (ASD) characteristically have difficulties with social communication and have been found to produce narratives that are less structurally complex than typically developing peers.

Five papers are included in this thesis by publication. In the first paper a systematic literature review is presented examining research into the effects of narrative intervention on the oral narratives of children with communication disorders. Overall the literature supports the use of narrative intervention to develop narrative macrostructure in children with oral communication disorders. Only four studies included participants with a diagnosis of ASD. Existing research supports the use of macrostructure icons, participants telling entire narratives and clinician modelling within intervention.

In the remaining four papers intervention studies are described that address the development of oral narrative macrostructure. In the first intervention study, a multiple baseline with probe design was used to examine the effects of intervention on the personal narratives of four children with ASD and severe language disorder. The same design was used to examine the effects of intervention on the fictional narrative retells on four children with ASD and severe language disorder. The third intervention study was a pilot AB study with one participant with ASD and language disorder that examined an original fictional narrative intervention. Following on from this pilot study, a multiple baseline with probe design was employed in the final intervention study to examine an original fictional narrative intervention with four children with ASD and language disorder. All studies included maintenance and generalisation probes. Overall, the narrative interventions appeared to be effective in improving the macrostructure for most participants, but individual responses were variable and modifications to the intervention procedures were necessary for some

participants. There was evidence of maintenance for most participants and some evidence of generalisation to other people and settings.

This thesis adds to the limited research into narrative intervention with children with ASD and significant language disorder. The studies presented provide evidence that intervention can be effective across a range of narrative types but individual responses to intervention may be idiosyncratic and some children may require individualised adjustments. The thesis also provides the first study of narrative retell intervention with this population.

## **Statement of Originality**

This work has not previously been submitted for a degree or diploma in any university.  
To the best of my knowledge and belief, the thesis contains no material previously published  
or written by another person except where due reference is made in the thesis itself.

(signed)

Date: 20 November 2019

## **Statement of Candidature**

I certify that the work in this thesis “The effects of oral narrative intervention on the narratives of children with ASD” has not previously been submitted for degree nor has it been submitted as part of requirements for a degree to any other university other than Macquarie University.

I also certify that this thesis is my own original work. Contributions and assistance have been appropriately acknowledged. I also certify that all work from other authors has been appropriately cited.

The research presented in this thesis was approved by the Macquarie University ethics committee, reference numbers 5201300450 (approved on 1 July 2013) and 5201800446 (approved on 3 July 2018). Ethics approvals are included as Appendix 2 of this thesis.

Kate Favot

December 2019

## Statement of Contribution

This is a statement of contribution to this thesis and the co-authored papers that comprise it. The following is a list of the papers written in conjunction with my academic supervisors Associate Professor Mark Carter and Associate Professor Jennifer Stephenson.

1. Favot, K., Cater, M., & Stephenson, J. (2019). The effects of oral narrative intervention on the narratives of children with language disorder: A systematic literature review. Manuscript under review.

I am the principal author of this review and took primary responsibility for conception, research design, data analysis and writing the manuscript, with advice from my supervisors Associate Professor Mark Carter and Associate Professor Jennifer Stephenson.

2. Favot, K., Cater, M., & Stephenson, J. (2019). The effects of an oral narrative intervention on the personal narratives of children with ASD and severe language disorder. *Journal of Behavioral Education*, doi:10.1007/s10864-019-09354-5

I am the principal author of this intervention study and took primary responsibility for conception, research design, data analysis and writing the manuscript, with advice from my supervisors Associate Professor Mark Carter and Associate Professor Jennifer Stephenson. Sarah Kirkwood conducted intervention with some of the participants under my supervision.

3. Favot, K., Cater, M., & Stephenson, J. (2018). The effect of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study. *Journal of Developmental and Physical Disabilities*, 30, 615-637. doi:10.1007/s10882-018-9608-y

I am the principal author of this intervention study and took primary responsibility for conception, research design, data analysis and writing the manuscript, with advice from my supervisors Associate Professor Mark Carter and Associate Professor Jennifer Stephenson.



4. Favot, K., Carter, M., & Stephenson, J. (2019). Brief report: A pilot study into the efficacy of a brief intervention to teach original fictional narratives to a child with ASD and language disorder. *Australasian Journal of Special and Inclusive Education*, 1-7. doi:10.1017/jsi.2019.7

I am the principal author of this intervention study and took primary responsibility for conception, research design, data analysis and writing the manuscript, with advice from my supervisors Associate Professor Mark Carter and Associate Professor Jennifer Stephenson.

5. Favot, K., Carter, M., & Stephenson, J. (2019). The effects of an oral narrative intervention on the original fictional narratives of children with ASD and language disorder. Manuscript under review.

I am the principal author of this intervention study and took primary responsibility for conception, research design, data analysis and writing the manuscript, with advice from my supervisors Associate Professor Mark Carter and Associate Professor Jennifer Stephenson.

## **Acknowledgments**

I would like to thank Associate Professor Mark Carter and Associate Professor Jennifer Stephenson for their expert academic supervision over the last three years. Their experience as supervisors, researchers and clinicians is reflected in the content of this thesis and it would not have been possible without them. In addition, I would also like to thank Sarah Kirkwood for implementing intervention in one of the studies, Taneka Kellet for collecting generalisation data and Betty Ho for conducting reliability measures in some of the papers. I would also like to thank the staff at MUSEC school, particularly our school principal Dr Sally Howell for creating a positive research and work environment.

I would like to thank the families of my participants in the personal narrative intervention for providing weekly photographs and narratives and for collecting data at home. That intervention would not have been possible without their commitment to the project. Importantly I would also like to thank the participants in all the practical intervention studies. Seeing developments in their language capabilities is the motivation behind this work.

Finally, I would like to thank my friends and my family, Brendan, Luca and Alessandro for their support.

## **Chapter One**

This thesis provides an examination of oral narrative intervention in children with language disorders with a particular focus on autism spectrum disorder (ASD). Chapter one provides definitions of core terminology and theories related to narratives and ASD. This chapter also provides an overview of the literature review (Chapter 2) and the four practical intervention papers (Chapters 3, 4 and 5) that combine to make up this thesis.

### **Narrative**

#### **Definition of Narratives**

Narratives are the earliest developing extended discourse and they possess a number of distinctive characteristics. They are linguistic descriptions of real or imaginary events (Lahey, 1988). They are temporally sequenced, causally related (Engel, 1995) linked utterances (Kaderavek, 2015) that are removed from the immediate context (Peterson, Jesso, & McCabe, 1999). Researchers have noted their broad importance to social (Cheshire, 2000) and academic development (Spencer & Petersen, 2018).

#### **Types of Narrative**

Individuals can generate several different types of narrative that serve a range of purposes. These include personal narratives, retellings of existing stories and original fictional narratives. Each of these types of narrative will now be addressed in turn.

**Personal Narratives.** Personal narratives describe and evaluate past experiences (McCabe, Bliss, Barra, & Bennett, 2008). They may be co-produced as part of conversation (Preece, 1987) from about two years of age (Allen, Kertoy, Sherblom, & Pettit, 1994) and by the time children enter formal schooling many are able to independently produce complex and complete personal narratives (Peterson & McCabe, 1983; McCabe & Rollins, 1994). Personal narratives may include scripts, which describe frequently occurring (Shiro, 2003)

and predictable (Eisenberg, 1985) events; recounts and accounts which relate specific past events (Gillam & Pearson, 2017) and classic high point narratives which include problems and a climax (McCabe & Rollins, 1994). Personal narratives also include reports, which provide an unremarkable account of happened, (e.g., what happened at school). Reports have been described as dreary and lacking in impact (Polanyi, 1985) or as a laundry list of events (McCabe & Rollins, 1994) but they do allow people to share experiences and, therefore, fulfill an important social function (Goldman, 2008).

**Fictional narrative retells.** Fictional narrative retells require an individual to listen to, read or watch a narrative and then retell it in their own words, (Kalmbach, 1986). Retellings are not attempts at verbatim recall. They are new narratives (Kalmbach, 1980) in which the narrator is able to illustrate understanding of the original narrative by selecting, organising and emphasising key information (Kalmbach, 1986).

**Original fictional narratives.** Original fictional narratives can reflect fabricated events based in reality or fantasy. Original stories based in reality reflect experiences that the individual could have experienced (e.g., missing a bus, a broken window). Original stories based in fantasy may contain experiences that are recognisable in the human experience but are improbable, (e.g., alligator wearing clothes), or impossible (e.g., fire breathing dragon) (Woolley & Cox, 2007). It has been suggested that the ability to generate an original fictional narrative is the prototype for imaginative pursuits throughout life (Paley, 1990) and that their true value is that narrator gets to create a world of their own liking (Engel, 1995). Original fictional narratives generated within the academic culture are generally created in response to a provided stimuli (Gillam, Gillam, & Reece, 2012; Green & Klecan-Aker, 2012) and require the narrator to reflect the content of stimuli and generate a relevant response.

### **Importance of Narrative**

Narratives have been called carriers of culture (Garnett, 1986) and the mode through which young language learners access the meaning system of their culture (Bruner, 1986). Narratives are a major milestone in language development. They represent transition from early language based in the “here and now” to language based in the “there and then” (Brown, 1973). They are the earliest developing (Hedberg & Westby, 1993) and for early school age children, the most common form (Karminloff-Smith, 1986) of extended discourse.

Narratives have been linked with the development of autobiographical memory as children exposed to repeated and complete narratives told by their mothers, based on shared events, have shown richer and more accurate memories of personally experienced events than children who have not been exposed to maternal narratives (Reese & Newcombe, 2007). Friendship researchers have argued that narratives told in friendship groups foster connectedness and group identity (Cheshire, 2000).

Generating a narrative is a complex skill that requires the speaker to coordinate cognitive, linguistic, and pragmatic skills (Nicolopoulou & Trapp, 2018). Cognitively the narrator is required to either remember or generate content appropriate to the context; linguistically they are required to organise that content within an accepted macro and micro structure framework; (Stirling et al., 2014) and pragmatically they are required to generate their narrative with an awareness of their audience (Lahey, 1988). In a longitudinal study of 87 children Bishop and Edmundson (1987) concluded that the capacity to tell a simple story was the single biggest predictor for language development over syntax, morphology and phonology.

The capacity to generate narratives has been called a bridge between oral language and literacy (Westby, 1991) and has been correlated with academic success (Hughes, McGillivray, & Schmidek, 1997) as narratives are a naturalistic way of organising the abstract thinking, complex language and sequencing that is required in academic learning

(Petersen, 2011). Spencer and Petersen (2018) and Morrow (1985) conducted macrostructure focused oral narrative interventions and concluded that intervention lead to improvements in the macrostructure of written narratives (Spencer & Petersen, 2018) and in literal, inferential, and critical thinking comprehension questions (Morrow, 1985).

Within the mainstream school system narratives are also a direct target for instruction. For example, within the Australian English curriculum students in year 1 are required to generate short imaginative texts (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2016). Crucially, narratives and other texts that are removed from the immediate context and are temporally and causally related also play a key role in student assessment (Bloome, Katz, & Champion, 2003). In Australia students have a one in two chance of being asked to write a narrative when they complete nationwide testing in years 3, 5, 7, and 9 and these narratives are then marked according to a structural conflict – resolution model of macrostructure (Caldwell & White, 2017).

### **Description and Assessment of Narrative Production Skills**

The quality of narratives may be evaluated in terms of various structural and organisational features. These features assist in establishing the content, organisation, clarity as well as the cohesion in the narrative and include, macrostructure, microstructure and internal states language.

**Narrative macrostructure.** Narrative macrostructure has been called both inherent to narrative (Sperry & Sperry, 1996) and the primary means of making sense of it (McCabe, 1991). Narrative macrostructure has been operationalised to include measures of story grammar (e.g., characters, setting, problem) and narrative quality (e.g., referencing of characters, and transitions between events or cohesion; Finestack, Palmer, & Abbeduto, 2012). The terms macrostructure and story grammar are, however, often used interchangeably in the literature (Petersen, Gillam, Spencer, & Gillam, 2010). It should be

noted that in the intervention papers and literature review in this thesis, the term macrostructure, unless otherwise stated, refers specifically to the story grammar component of macrostructure.

*Story grammar.* Story grammars have evolved, in part from Bartlett's (1932) work on memory theory (Stein & Glenn, 1978). Bartlett (1932) proposed that stories were not recalled verbatim, but were rather reconstructed by mapping incoming information onto existing, but unspecified, unconscious mental representations of events, or schematas. Researchers have used models of story grammar to further investigate the processes involved in story memory and have nominated specific primary elements of analysis and created rules about the order of those elements (Hickman, 2003). Story grammars have been created using varied terminologies and numbers of required elements by Rumelhart (1975), Thorndyke (1977) Mandler and Johnson (1977) and Stein and Glenn (1978).

Stein and Glenn's (1978) seminal investigation utilized a story grammar that included; *setting, initiating event, internal response, internal plan, attempt, direct consequence, and reaction*, to investigate the influence of story grammar on story recall. The authors collected storybook retells from 48 children and found that children's sequencing of story information corresponded to the sequencing of events in the stimulus stories. They concluded that children made distinctions between different types of information and that those distinctions related to story grammar elements.

Stein and Glenn's model of story grammar has been developed and used as the basis for the profiling of narrative production skills (e.g., Petersen, Gillam, & Gillam, 2008), narrative assessment (e.g., Spencer & Petersen, 2010) and intervention (e.g., Spencer & Petersen, 2012). The abstract concept of a story schema became measureable with the development of models of story grammar and has been found to guide the processing and production of stories (Hickman, 2003).

**Narrative microstructure.** Narrative microstructure encompasses the words and sentences that are used in narrative construction (Gillam, Gillam, Fargo, Olszewski, & Segura, 2017). Measures of narrative microstructure include markers of productivity, such as total number of words and number of different words, and markers of complexity, such as coordinating and subordinating conjunctions (Justice et al., 2006). Microstructure also includes vocabulary and morphology (Finestack, 2012). While microstructure is not fundamental to the production of narrative it may help the listener understand the sequence of macrostructural elements (Spencer, Kajian, Petersen, & Bilyk, 2013).

**Internal states language.** Internal states language describes all expressions of internal or mental states of protagonists within a narrative. Internal states language can include references to emotion (e.g., happy), cognition (e.g., think), evaluation (e.g., good), modality (e.g., should), and physiology (e.g., hungry; Kauschke & Klann-Delius, 1997). Researchers have stated that internal states language is necessary in narrative to generate the sophisticated narrative structures that are required to describe characters' motivations (Gamannossi & Pinto, 2014), how they interact with other characters and for the development of the plot or theme (Hewitt, 2019).

### **Narrative Development**

By the time children in mainstream western cultures enter school at around age five most are able to generate complete and competent personal and fictional narratives (Applebee, 1978; Benson, 1993; Owens, Jr., 2016) which then continue to develop in complexity through adolescence and into adulthood (Genereux & McKeough, 2007). A number of authors have provided profiles of the structural development of narrative in children (e.g., Applebee, 1978; Botvin & Sutton-Smith, 1977; Stadler & Ward, 2006).

Researchers investigating models of narrative structural development have suggested that these models are highly comparable (Lander, 2012) using different terminologies and



categories to profile broadly similar stages of narrative development. For example, at a basic level, researchers have referred to a single word, heaps (Applebee, 1978), level 0 (Botvin & Sutton-Smith, 1977) or labelling stage (Stadler & Ward, 2006). At a more complex level, researchers have described a true narrative (Applebee, 1978) or narrating (Stadler & Ward, 2006) stage. This level includes cause and effect, temporal sequencing, developed plots, evidence of planning and reference to goals.

Applebee (1978), for example, provided a developmental sequence for narrative development and identified six structural stages. The first stage was referred to as heaps, which are collections of unrelated ideas that emerge around two years of age. Sequences develop from three years of age and contain recurring themes but no required order. Subsequently, primitive narratives develop from four years of age and contain themes with interpretation and prediction. Unfocused chains, also develop from four years of age, and have no central character or topic, but have causally linked and logical relationships. Focused chains emerge from five and they have central characters and sequenced events, but no defined ending. Finally, true narratives emerge from around seven years of age and contain character and plot development, a problem and a resolution.

### **Narrative Theory**

Narrative theory is a diverse, multi-disciplinary and an evolving field (Phelan & Rabinowitz, 2008). Researchers from linguistics, psychology, history, anthropology, and religion classify and describe narrative, (Barthes & Duisit, 1975) give insight into its functions (Liles, 1993) and use theories to illustrate how cultures make sense of experience (McCabe, 1991). A comprehensive survey of the current landscape of narrative theory and the degree to which they augment rather than supplant each other (Richardson, 2000) is beyond the scope of this thesis. Nevertheless, a brief overview of some general approaches to

the conceptualisation and analysis of narrative will now be offered and the general theoretical orientation of the thesis identified.

The origins of narrative theory, with roots in Aristotelian philosophy has structural plot based notions of narrative at its core, with a beginning, a middle, an end and a hero who passes from misfortune to happiness or vice versa (Altman, 2008). From his study of fairytales in the 1920s, Russian formalist, Propp (1968) identified a corpus of 31 events or story functions that may appear in a narrative and rotate around a central problem. Building on Propp's proposal that key events and functions are central to narrative, Todorov (1971) nominated five essential stages in narratives; equilibrium, equilibrium breakdown, recognition of breakdown, action and then, a new equilibrium. Labov and Waletzky (1997) broadened the scope of structural narrative theory when they analysed spoken narratives of personal experience and concluded that narratives were temporal, recapitulated experience and were evaluative .

Structural analysis of narrative is not concerned with *what* narratives mean but rather *how* they mean as narratives (Herman, 2007). Prince (1997) suggests that structural narrative theorists regard narratives as rule governed systems for fashioning the universe. Structural theories may also propose limits to an unlimited range of possibilities (Hyvarinen, 2008) and generate order (Rimmon-Kenan, 2003). The utility of structural theory for consumers of narrative could lie in story processing, being able to retell stories and to identify variants of the same story (Rimmon-Kenan, 2003).

While traditional structural narrative theory may present itself as descriptive and non ideological (Chambers, 1984), feminist narrative theory has been called impressionistic, evaluative and political (Lanser, 1986). Feminist narrative theorists state that meaning comes through interpretation of the texts considering the socio-historical contexts that produced and consume them (Warhol, 2012). Feminist critics are often more concerned with the

development and representation of characters and their relationship to gendered power than with any other aspect of narrative (Lanser, 1986).

The rhetorical approach to narrative theory views narrative as somebody telling a story to an audience, for a purpose (Phelan, 1996). In contrast to feminist narrative theory, rhetorical narrative theory does not preselect issues such as gender for analysis but rather strives for flexibility in the account of what narratives seek to achieve (Phelan & Rabinowitz, 2012). Primarily the rhetorical approach is interested in the author's communication to the audience and how narratives affect audiences through words, techniques, and structures and the genres and conventions that readers use to understand text (Phelan & Rabinowitz, 2012).

The approach taken in this thesis, particularly in the intervention studies, derives from a structural approach to narratives. An understanding of narrative from a structural point of view enables individuals to organise, understand and remember events (Schank & Abelson, 1977) and possibly produce narrative. The structural approach provides a framework for understanding the organisation of narratives and for assessment and intervention. Thus, this theoretical approach forms the foundation for this thesis.

## **ASD**

Autism spectrum disorder (ASD) is a lifelong (Baird et al., 2006) neurodevelopmental disorder characterised by deficits in social communication and social interaction and by restricted and repetitive patterns of behavior (American Psychiatric Association, 2013). ASD is diagnosed as presenting with or without accompanying conditions, (e.g., language impairment, intellectual impairment American Psychiatric Association, 2013).

Prevalence rates have been reported as 1.7% in the United States (Baio et al. 2018) and parent and teacher reported prevalence rates for ASD in Australia have been documented by May, Sciberras, Brignell, & Williams (2017) to be between 1.9% and 3.9%. Males have been estimated to be four times as likely as females to be diagnosed with ASD (Baio et al., 2018)

and approximately 31% individuals with ASD have been estimated to have an accompanying intellectual impairment (Baio et al., 2018). Three cognitive theories will now be examined that may provide insight into a range of capabilities of individuals with ASD and, in particular, how they may impact on the development of narrative skills (Stirling et al., 2014).

**Theory of mind.** An individual has theory of mind (ToM) if they are able to infer the mental states (beliefs, desires, imagination, emotions) that cause action (Baron-Cohen, 2000) in themselves or others (Premack & Woodruff, 1978) and to empathise (Baron-Cohen, 2010). In their seminal study, Baron-Cohen et al. (1985) investigated the comparative performance of typically developing children, children with Down syndrome and children with autism on a false belief task that required them to predict what they thought someone, who had partial knowledge of a situation, would do. All children were equally able to answer control questions regarding the actual events in a scenario. Typically developing children and children with Down syndrome passed the false belief questions at similar rates of around 85%. These two groups of children were able to predict what a character, in a given scenario would do, based on what that character believes to be true, while only 20% of children with autism were able to accurately predict what the character would do. Baron-Cohen et al. concluded, based on this data, that children with autism demonstrate ToM dysfunction (1985).

Eigisti et al. (2011) suggest that difficulties individuals with ASD have in understanding and communicating the contents of other people's minds may lead to significant deficits in the production and comprehension of narrative language. Deficits in theory of mind may impact on the ability of individuals with ASD to produce narratives with understanding and/or causal explanations of the thoughts, feelings and motivations of the story's characters, and with an awareness of the audience's needs such as appropriate

background information and referencing (King, Dockrell, & Stuart, 2014; Loveland & Tunali, 1993).

Capps and Losh (2000) analysed the narratives of 13 children with ASD and compared them with the narratives of language matched control groups. They concluded that the decreased use of mental state language amongst children with autism was positively correlated with performance on ToM tests and that children with ASD were less likely than controls to attribute reasons for a character's mental state.

The exact nature of the relationship between theory of mind and narrative is unclear. Hadwin et al. (1997) conducted a pre-test post-test research study to investigate the effects of teaching 15 children with autism theory of mind skills, (emotion, perspective taking, pretend play) on their capacity to generate a story in response to a wordless picture book. The researchers concluded that, although the participants were taught to pass the theory of mind tests, there was no development in their story telling skills or in their use of mental state terms. In addition, questions have been raised about the effectiveness of ToM training. Fletcher-Watson et al. (2014) conducted a Cochrane review of 22 ToM intervention studies with individuals with ASD and found that there was some evidence that people with ASD can be taught ToM mind tasks but there was currently only poor quality evidence that these skills can be maintained or generalised to other settings. They concluded overall that these findings could imply that the ToM model has little relevance for educational or clinical practice in the treatment of ASD (Fletcher-Watson et al., 2014).

**Executive function.** Executive functions are a set of processes that regulate thoughts and behaviours (Miyake & Friedman, 2012). Executive functions include planning (goal directed behavior), working memory (ability to store and process information simultaneously), mental flexibility and inhibition (Hill, 2004). Ozonoff and McEvoy (1994) conducted a three-year longitudinal control group study that examined planning skills in 23

children with ASD and concluded that children with ASD performed significantly below control groups and may reach a ceiling. Shu et al. (2001) found that children with ASD perform significantly below typically developing controls on measures of mental flexibility and may be highly perseverative. Ozonoff and Jensen (1999) also concluded that planning and mental flexibility is impaired in this population but further concluded that children with ASD perform as typically developing controls on measures of inhibition.

Conclusions surrounding the working memory capabilities of individuals with ASD are conflicting (Barendse et al., 2013). While some researchers have concluded that individuals with ASD are not impaired (e.g., Sinzig, Morsch, Bruning, Schmidt, & Lehmkuhl, 2008), others have concluded the opposite (e.g., Corbett, Constantine, Hendren, Rocke, & Ozonoff, 2009). Researchers have conducted studies to measure the effect of working memory interventions on individuals with ASD. For example, de Vries et al. (2015) found that, although working memory improved, there was no transfer of skills to either other executive function skills or to skills of daily life as measured by a standardised adaptive behaviour tool. Other researchers have claimed, however, that gains made on measures of working memory have generalised to unstandardised measures of adaptive living (Kenworthy et al., 2014).

While research that examines executive function in individuals with ASD has been mixed, deficits in overall executive function may impact on the ability of an individual with ASD to generate adequate ideas or syntax for narrative (King et al., 2014). Text coherence may also be reduced (Baixauli, Colomer, Roselló, & Miranda, 2016) as the demands of coordinating and integrating information, as is required in narrative, may cause difficulties (Stirling et al., 2014). There is a lack of research directly relating executive functioning skills in individuals with ASD to their narrative performance but it is possible that deficits in working memory might lead to difficulties when retelling a narrative.

**Weak central coherence.** Weak central coherence theory suggests that individuals with ASD are biased toward processing local over global information (Nuske & Bavin, 2011). Happe and Frith (2006) reviewed 50 studies of coherence in individuals with ASD and concluded that individuals with ASD may present with superior skills in detail focused processing but that the subsequent trade-off to global processing is unclear. Barnes and Baron-Cohen (2012) analysed narrative retellings from 28 adults with ASD in comparison with controls to determine the possible impact of weak central coherence on narratives. They concluded that adults with ASD were as likely as controls to include necessary story grammar (macrostructure) elements but the information included in each element was qualitatively different. Barnes and Baron-Cohen (2012) reported that when retelling narratives, adults with ASD concentrated on specific objects, actions or dialogue rather than on generalised or summative information that would provide the gist of the story. Thus, although information in each element was correct, it was not always meaningful to the whole narrative.

Just as one primary deficit may not account for all the manifestations in ASD (Ozonoff, Pennington, & Rogers, 1991) one primary cognitive explanation may not account for presentation of narrative skills in individuals with ASD (Brunsdon & Happé, 2014; King et al., 2014). Authors who present the fractionable account of ASD (Happé, Ronald, & Plomin, 2006) suggest that people with ASD may present with some, but not all, of these cognitive process deficits. While cognitive theories offer insight into reasons why narrative may be difficult for people with ASD they do not necessarily inform intervention. Although there is some evidence for the capacity of individuals with ASD to improve on tasks that directly measure the cognitive skills taught, there is much less evidence of generalisation of those taught skills to other areas (de Vries et al., 2015; Fletcher-Watson et al., 2014).

### **Narrative Production in Individuals with ASD**

Language abilities in individuals with ASD are highly variable (Kjelgaard & Tager - Flusberg, 2001). By definition individuals with autism spectrum disorder experience social difficulties so all will necessarily experience difficulties with pragmatic (social) communication (Nicholas et al., 2008). Researchers have documented deficits in the understanding and production of conversation (Paul, Orlovski, Marcinko, & Volkmar, 2009; Sng, Carter, & Stephenson, 2018), metalinguistic skills including figurative language (Kalandadze, Norbury, Nærland, & Næss, 2018) and mental state verbs (Bang, Burns, & Nadig, 2013), prosody (Paul, Augustyn, Klin, & Volkmar, 2005) and non-verbal social rules (Humphrey, 2008). Individuals may also encounter difficulties with narrative (Baixauli et al., 2016).

To date two systematic literature reviews have been published in which authors synthesise the findings of 45 different investigations into the narrative production skills of 870 individuals from 5 years of age to adulthood with a diagnosis of ASD and, typically, IQ and language abilities within normal limits (Baixauli et al., 2016; Stirling et al., 2014). Profiles of the narrative production skills of this population are characterised by a high degrees of inconsistency due to variations in participants (e.g., age, severity of ASD diagnosis), stimulus materials (e.g., verbal prompts, picture sequences), types of narrative elicited (e.g., personal, original narratives, retells), analysis tools and research methodology (e.g., variation in the comparison group; Stirling et al., 2014). Nevertheless, common themes across the macrostructure, microstructure and internal states language of narrative are emerging (2016).

**Narrative macrostructure in individuals with ASD.** It appears that individuals with ASD generate narratives with impaired story structure (Baixauli et al., 2016). A small number of researchers have used partially structured stimulus materials, such as verbal story stems with accompanying single pictures (King et al., 2014), or unstructured stimulus



materials, such as themes (e.g., visit to the hospital, first day of school; Goldman, 2008; Losh & Capps, 2003). Nevertheless, narrative macrostructure in this population has been most commonly studied by analysing narratives elicited in response to highly structured stimulus materials. These materials have included wordless picture books (Banney, Harper-Hill, & Arnott, 2015; Norbury, Gemmell, & Paul, 2014), or sequenced pictures (Estigarribia et al., 2011). Such structured materials provide much of the story macrostructure for the narrator and it may be therefore that narrative skills in this population are overestimated (Hedberg & Westby, 1993) and impairment of macrostructure is underestimated.

**Narrative microstructure in individuals with ASD.** The narratives of individuals with ASD have been found to be shorter (Capps, Kehres, & Sigman, 1998; King et al., 2014; Tager-Flusberg, 1995) and with fewer different words (Norbury et al., 2014) than typically developing peers. Researchers have also found that individuals with ASD may produce narratives that are less syntactically complex (Banney et al., 2015; Norbury & Bishop, 2003), and with more ambiguous referential markers (Banney et al., 2015) than typically developing peers. Production of impaired microstructure may impact on the listener's capacity to understand the sequence of events, and causal relations (Spencer et al., 2013) in a narrative. It may also impact the elaboration of ideas within a narrative and limit narrative production to the transmission of information (Ukrainetz et al., 2005) or the listing of discrete events (Diehl, Bennetto, & Young, 2006).

Children with language disorder may not be able to simultaneously improve both macrostructure and microstructure over a short period (Colozzo, Morris, & Mirenda, 2015; Justice et al., 2006) and sophisticated microstructure may not be necessary for narrative comprehensibility (Peterson & McCabe, 1991). Thus, the core element of narrative macrostructure, story grammar, will be the focus of this thesis.

**Internal states language in narratives in individuals with ASD.** Conclusions drawn

by researchers who have attempted to profile internal states language use by individuals with ASD are mixed. When analysing narratives produced in response to wordless picture books some researchers have concluded there is no difference between ASD groups and matched controls (Bang et al., 2013; Norbury et al., 2014; Suh et al., 2014) while others have found that ASD groups include less internal states language ( Banney et al., 2015; Kristen, Vuori, & Sodian, 2015). Siller et al. (2014) reported that, although there were no differences between the groups on use of cognitive internal states language (e.g., think), there were differences in the use of emotion internal states language (e.g., happy). In contrast, Rumpf et al. (2012) concluded use of emotion internal states language was the same between groups but found a difference in the use of cognitive terms.

### **Research on Narrative Intervention with Children with ASD**

Despite the importance of narrative to social and academic development and the documented deficits that individuals with ASD experience in constructing narrative, prior to the work conducted in this thesis, only three intervention studies were published that investigated the effects of explicit oral narrative intervention on the narratives of children with ASD (Favot, Carter, & Stephenson, 2018b; Gillam, Hartzheim, Studenka, Simonsmeier, & Gillam, 2015; Petersen et al., 2014).

Petersen et al. (2014) implemented a multiple baseline research design and investigated the effects of intervention on individually targeted macrostructure elements in classic high point personal narratives. Three boys aged between six and eight with “weaknesses in expressive language” received between 6 to 8 hours of one-to-one intervention with sessions lasting between 30 and 40 minutes. Intervention included the use of macrostructure icons, five picture sequences to support a clinician’s model narrative, systematic prompt withdrawal and the participant being provided with the opportunity to tell a narrative each session. A

clear intervention effect was demonstrated for four of the seven individual macrostructure elements measured and maintenance was demonstrated for two macrostructure elements.

Gillam et al. (2015) used a multiple baseline design with five children aged between eight and 12 to investigate the effects of intervention on the combined macrostructure score of original fictional narratives. All participants had an “educational diagnosis” of autism. One participant had language abilities within normal limits, one a mild disorder and two had moderate to severe language disorder. Participants received between 17.5 hours and 27.5 hours of one-to-one intervention. Intervention included the use of purpose designed wordless picture books, icons to represent macrostructure elements, pictography, prompt fading, the clinician modelling the entire narrative, comprehension questions, vocabulary, teaching self-editing, and the participant being provided with the opportunity to say an entire narrative each session. An intervention and maintenance effect was evident for four of the five participants on the combined macrostructure score.

Favot et al. (2018b) conducted a multiple baseline design study with three participants aged 5-6 with ASD and severe language disorder to investigate the effects of oral narrative intervention on a combined macrostructure score that incorporated the *where*, *who with*, *what* and *feelings* of early developing personal narrative. Participants had verbal IQs of 70 or below or they scored at or below the first percentile on the Peabody Picture Vocabulary Test, Fourth Edition (Dunn & Dunn, 2007). Participants received between 1.4 and 7.2 hours of one-to-one intervention with sessions lasting between three and 10 minutes. Intervention involved the use of icon cards to represent each macrostructure element; photographs of personally experienced recent events to support the production of each narrative; the clinician modelling the entire narrative, and participants being provided with an opportunity to say an entire narrative independently each session. An intervention effect was demonstrated for all three participants. Maintenance and generalisation probes were collected for two participants

and a maintenance effect and generalisation to other settings was demonstrated but not generalisation of the skill to other people. Social validity was conducted and post intervention narratives were rated as better than pre intervention narratives in 11 out of 12 instances by a naive rater.

Oral narrative intervention with children with ASD is a developing area and early studies are promising. More research is needed with children with a diagnosis of ASD and language disorder and other disabilities such as intellectual impairment. More research is also needed into the effects of fictional narrative retells, generating original fictional narratives and personal narrative and into ways to generalise skills taught in intervention to other settings, people and stimuli.

### **Methodological Approach**

A systematic literature review was conducted to establish the state of the existing research in which researchers investigated the effects of narrative intervention with children with language disorder. This was guided by the methodological principles established by Schlosser, Wendt, and Sigafoos (2007) for evaluating the quality of systematic literature reviews. The research methodology of the four practical narrative intervention papers in this thesis were informed by the framework of applied behaviour analysis (ABA).

Schlosser, Wendt, and Sigafoos (2007) set out the following several principles for evaluating the quality of systematic literature reviews. They state that the protocol of reviews should be established a priori and that research questions should be clearly expressed. Databases and other sources used to locate studies should be identified and that article inclusion and exclusion criteria should be clearly stated. Extracted data should be coded and the processes involved in data extraction should be described. Finally, they state that articles included for review should be assessed for quality and that outcome metrics should be conducted by reviewers and reported.

The approach to the intervention studies described in this thesis is informed directly by the framework of applied behaviour analysis (ABA). ABA sits alongside experimental analysis of behaviour within the behavioural approach (Dillenburger & Keenan, 2009). The central tenant of behaviourism is that the causes of observed behaviour are often in the environment and can therefore be understood (Cooper, Heron, & Heward, 2007). ABA is the science in which understandings gained from experimental analysis of behaviour are applied in a systematic way to bring about behaviour change and experimentation is used to identify variables responsible for change (Cooper, Heron, & Heward, 2007).

For a study to sit within the ABA framework, Baer et al. (1968) specified that certain criteria be met. Studies should be applied, meaning that the behaviour under study has social rather than theoretical importance. Further, it should be behavioural, with the focus on the observable performance of the individual. It should also be analytic, requiring the researcher to demonstrate control over behaviour in the sense that there is a clear and reproducible relationship between intervention and behaviour change. It should be technological, with all techniques accurately and comprehensively identified and reported, and it should be conceptually systematic, with studies including full descriptions of how techniques and procedures make sense within the ABA framework. Finally, studies should be effective, with research outcomes having importance to practical situations, and should demonstrate generality, meaning that the effects of the treatment are observable over time, in different settings and across different behaviours.

As outlined by Baer (1968), studies that sit within the ABA framework should have a social importance. The social importance of a study can be assessed by measures of social validity. Researchers use social validity measures in an attempt to gather information from the society of the individual whose behavior is being changed (Kennedy, 1992) and to establish that the targeted behaviours are desired by the wider society. Social validity

measures are used to establish if the intervention procedures are appropriate and acceptable and that the stakeholders are satisfied with the results of the intervention (Wolf, 1978).

Single case research was employed as a methodology for evaluation of the effectiveness of intervention in this thesis. Single case research has been developed within the ABA framework as a mechanism to identify the relationship between the behaviour of the individual and the environmental factors that are related to the occurrence of that behaviour (Plavnick & Ferreri, 2013).

Horner et al. (2005) established the following principles in regard to the quality of single case research. The individual is the unit of analysis and therefore serves as their own control. Participants and settings must be operationally defined. The dependent variable must be socially significant and observable, be operationally defined and measured repeatedly. The independent variable must be actively manipulated and its fidelity measured (Horner et al., 2005). Finally they state that operational descriptions should be detailed and precise to allow replication by other researchers (Horner et al., 2005).

In single case research each participant's performance on the target behaviour is measured repeatedly, graphed and analysed (Kennedy, 2005) until consistent patterns of behaviour are observed (Horner et al., 2005) and a functional relation between the dependent and the independent variable can be established (Kennedy, 2005). Participant behaviour is analysed according to three features of visual analysis of graphed responses (Kennedy, 2005). First, the level or mean of the data for each phase is established. Second, the trend or best fit straight line that can be placed over the data in each phase is observed and finally variability or the degree to which individual data points deviate from the trend is established (Kennedy, 2005). Kratochwill et al., (2010) described three additional strategies to examine data across phases. First, researchers should assess the immediacy of the change in data. Second, researchers should examine the overlap of data points between phases and third, they should

analyse the consistency of data in all baseline and all intervention phases (Kratohwill et al., 2010).

A multiple baseline across participants with probe design was used in the three practical interventions in this thesis and an AB design in one pilot study. In a multiple baseline with probe design experimental effect should be replicated across a minimum of three participants (Horner et al., 2005). All participants enter the baseline phase at the same time (What Works Clearinghouse, 2017). When participant one enters true baseline with daily probes being collected, the remaining participants' baseline performance is measured via intermittent probes (Kennedy, 2005). Intermittent probes are an alternative to continuous baseline measurements, which may be impractical, or reactive (Horner & Baer, 1978). Participant one begins intervention after a minimum of five true baseline data points have been collected (Kennedy, 2005) and performance is stable (Gast, Lloyd, & Ledford, 2018). When participant one demonstrates a stable intervention effect participant two enters true baseline and begins intervention when baseline performance is stable (Kennedy, 2005). This process is repeated until all participants enter the intervention phase. Multiple baseline designs are suitable designs for applied contexts where behavior cannot be reversed or it is unethical to do so (Kennedy, 2005).

Single case research designs have been developed as a practical option for conducting internally valid experimental studies in educational research contexts with small heterogeneous samples (Odom et al., 2005). A further benefit to researchers investigating intervention effects in populations with idiosyncratic behaviours is that single case research designs are adaptive and allow for modifications to an individual's intervention procedure if they are not responding (Plavnick & Ferreri, 2013).

### **Aims of Research**

Given the importance of narrative to social and academic performance, and the potential benefit of intervention, the aim of this thesis is to investigate oral narrative intervention in children with ASD and communication disorders. The following questions provided a framework for the research described:

1. What is the efficacy of oral narrative intervention with children with communication disorders and what is the quality of research exploring those interventions?
2. What is the effect of oral narrative intervention on the personal narratives of children with ASD and severe language disorder?
3. What is the effect of oral narrative intervention on the fictional narrative retells of children with ASD and severe language disorder?
4. What is the effect of oral narrative intervention on the original fictional narratives of children with ASD and language disorder?

### **Thesis Structure**

This thesis consists of five self contained manuscripts, three formatted in journal article style and two presented in journal submission ready format. An introductory and concluding chapter are provided, as are chapter overviews for each of the self-contained manuscripts. The publication status for each manuscript is presented in the chapter overview.

### **Chapter Outline**

**Chapter 2.** The systematic literature review presented in chapter 2 examines the quality, efficacy and common features of oral narrative intervention with children with language disorders. The results of the review indicated that oral narrative intervention may be effective in teaching children with language disorders to generate oral narrative. The quality of 25 intervention studies was examined in detail and, although the single case research was found to be generally of good quality, the group studies were generally of low quality with



only four studies including comparison groups. The researchers calculated two effect size measures on the data provided in the single case research studies and concluded that overall effects sizes for macrostructure were moderate. Effect sizes for microstructure were lower. The calculated effect sizes for comparative group studies were variable. The successful interventions were found to include icons to represent macrostructural elements, visuals to represent narratives, clinician modelling and the participants being provided an opportunity to tell an entire narrative each intervention session. Future research should involve more comparison group studies, delivery of intervention in group settings, inclusion of participants with a wider range of disabilities, including ASD, in interventions, and more measurement of generalization. Further research on the effect of intervention on personal narrative generation in particular is needed.

**Chapter 3.** Chapter 3 presents a study employing a multiple baseline with probe design to investigate the effect of an oral narrative intervention on the macrostructure of personal narratives of four children with ASD and severe language disorder (Favot, Carter, & Stephenson, 2019). This study is a replication of a pilot study, and includes amendments made to the pilot study intervention procedure (Favot et al., 2018b). It includes icons to represent each macrostructure element, clinician prompting, and modelling and the participant being provided with an opportunity to say an entire personal narrative each intervention session. Maintenance data and four measures of generalisation data were collected. Results from the study indicate a strong intervention effect for three of the four participants and maintenance for two. Two participants did not make adequate initial progress, and amendments to increase intensity were made to the intervention procedure. One participant displayed an increase in scores across all measures of generalisation and one participant showed some evidence of improvement in one measure. This study represents one

of the few examining personal narratives in children with ASD and is the first to investigate a wide range of personal narrative generalisation measures.

**Chapter 4.** Chapter 4 presents a multiple baseline with probe study examining the effect of an oral narrative intervention on the macrostructure of fictional narrative retells of four children with ASD and severe language disorder (Favot, Carter, & Stephenson, 2018a). The intervention included icons to represent each macrostructure element, clinician prompting, and modelling and the participant being provided with an opportunity to retell an entire narrative each intervention session. Results indicate an intervention and maintenance effect for three participants. Generalisation to storybooks typically used in the classroom was not demonstrated. This study represents the first attempt to address fictional narrative retells as the primary dependent variable with participants with ASD and severe language disorder.

**Chapter 5.** Chapter 5 includes a pilot study and an extension multiple baseline study. The pilot AB single case research, with a single participant with ASD and language disorder, involved a brief oral narrative intervention addressing original fictional narratives based on a realistic problem. The aims of the pilot study were to trial the measurement and evaluate the feasibility of the intervention procedures. Results indicated an intervention effect but there was no generalisation effect to fantasy based narratives. No adjustments were required to the intervention procedures and it seemed feasible. The need for refinements to the measurement and to the presentation of the fantasy-based generalisation stimulus materials was identified.

The second manuscript in chapter 5 describes an extension of the pilot study in which the researchers employed a stronger multiple baseline with probe research design. Following the pilot study changes were made to data collection procedures, generalisation stimulus materials and the timing of the generalisation probes. The intervention included the same materials and strategies as the pilot study. There was evidence of intervention, maintenance and generalisation effects for three of the four participants. This study was the first to provide

an investigation of fictional narrative generalisation and the intervention was considerably less intense than those in previous studies.

**Chapter 6.** The final chapter in this thesis is a summary and general discussion of the presented research. The limitations of the studies, their original contribution to the existing field of research and areas for future research are outlined.

## References

- Allen, M. S., Kertoy, M. K., Sherblom, J. C., & Pettit, J. M. (1994). Children's narrative productions: A comparison of personal event and fictional stories. *Applied Psycholinguistics*, 15, 149-176. doi:10.1017/S0142716400005300
- Altman, R. (2008). *A theory of narrative*. New York, NY: Columbia University Press.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Applebee, A. N. (1978). *The child's concept of a story: Ages two to seventeen*. Chicago, IL: The University of Chicago Press.
- Australian Curriculum, Assessment and Reporting Authority [ACARA]. (2016). *Australian Curriculum: English*. Retrieved from <https://www.australiancurriculum.edu.au/f-10-curriculum/english/?layout=1#cdcode=ACELA1428&level=F>
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1, 91-97.
- Baio, J., Wiggins, L., Christensen, D. L., Maenner, M. J., Daniels, J., Warren, Z., . . . Imm, P. (2018). Prevalence of autism spectrum disorder among children aged 8 years -Autism and developmental disabilities monitoring network, 11 sites, United States, 2014. *Surveillance Summaries*, 67, 1-23. doi:<http://dx.doi.org/10.15585/mmwr.ss6706a1>
- Baird, G., Simonoff, E., Pickles, A., Chandler, S., Loucas, T., Meldrum, D., & Charman, T. (2006). Prevalence of disorders of the autism spectrum in a population cohort of children in South Thames: The special needs and autism project (SNAP). *The Lancet*, 368, 210-215. doi:10.1016/S0140-6736(06)69041-7
- Baixauli, I., Colomer, C., Roselló, B., & Miranda, A. (2016). Narratives of children with high-functioning autism spectrum disorder: A meta-analysis. *Research in Developmental Disabilities*, 59, 234-254. doi:10.1016/j.ridd.2016.09.007

- Bang, J., Burns, J., & Nadig, A. (2013). Brief report: Conveying subjective experience in conversation: Production of mental state terms and personal narratives in individuals with high functioning autism. *Journal of Autism and Developmental Disorders*, 43, 1732-1740. doi:10.1007/s10803-012-1716-4
- Banney, R. M., Harper-Hill, K., & Arnott, W. L. (2015). The Autism Diagnostic Observation Schedule and narrative assessment: Evidence for specific narrative impairments in autism spectrum disorders. *International Journal of Speech - Language Pathology*, 17, 159-171. doi:10.3109/17549507.2014.977348
- Barendse, E. M., Hendriks, M. P., Jansen, J. F., Backes, W. H., Hofman, P. A., Thoonen, G., . . . Aldenkamp, A. P. (2013). Working memory deficits in high-functioning adolescents with autism spectrum disorders: neuropsychological and neuroimaging correlates. *Journal of Neurodevelopmental Disorders*, 5, 14. doi:10.1186/1866-1955-5-14
- Barnes, J. L., & Baron-Cohen, S. (2012). The big picture: Storytelling ability in adults with autism spectrum conditions. *Journal of Autism and Developmental Disorders*, 42, 1557-1565. doi:10.1007/s10803-011-1388-5
- Baron-Cohen, S. (2010). Empathizing, systemizing, and the extreme male brain theory of autism. *Progress in Brain Research*, 186, 167-175. doi:10.1016/b978-0-444-53630-3.00011-7
- Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a “theory of mind”. *Cognition*, 21, 37-46. doi:10.1016/0010-0277(85)90022-8
- Baron-Cohen, S. (2000). Theory of mind and autism: A fifteen year review. In S. Baron-Cohen, H. Tager-Flusberg, & D. J. Cohen (Eds.), *Understanding other minds: Perspectives from developmental cognitive neuroscience* (pp. 3-20). New York, NY: Oxford University Press.

- Barthes, R., & Duisit, L. (1975). An introduction to the structural analysis of narrative. *New Literary History*, 6, 237-272. doi:10.2307/468419
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. London, England: Cambridge University Press.
- Benson, M. S. (1993). The structure of four-and five-year-olds' narratives in pretend play and storytelling. *First Language*, 13, 203-223.
- Bishop, D. V. M., & Edmundson, A. (1987). Language-impaired 4-year-olds distinguishing transient from persistent impairment. *Journal of Speech and Hearing Disorders*, 52, 156-173. doi:10.1044/jshd.5202.156
- Bloome, D., Katz, L., & Champion, T. (2003). Young children's narratives and ideologies of language in classrooms. *Reading & Writing Quarterly*, 19, 205-223. doi:10.1080/10573560308216
- Botvin, G. J., & Sutton-Smith, B. (1977). The development of structural complexity in children's fantasy narratives. *Developmental Psychology*, 13, 377-388.
- Brown, R. (1973). *A first language: The early stages*. Cambridge, MA: Harvard University Press.
- Bruner, J. S. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Brunsdon, V. E., & Happé, F. (2014). Exploring the 'fractionation' of autism at the cognitive level. *Autism*, 18, 17-30. doi:10.1177/1362361313499456
- Caldwell, D., & White, P. R. R. (2017). That's not a narrative; this is a narrative: NAPLAN and pedagogies of storytelling. *Australian Journal of Language and Literacy*, 40, 16-27.

- Capps, L., Kehres, J., & Sigman, M. (1998). Conversational abilities among children with autism and children with developmental delays. *Autism*, 2, 325-344.  
doi:10.1177/1362361398024002
- Capps, L., Losh, M., & Thurber, C. (2000). "The frog ate the bug and made his mouth sad": Narrative competence in children with autism. *Journal of Abnormal Child Psychology*, 28, 193-204. doi:10.1023/A:1005126915631
- Chambers, R. (1984). *Story and situation: Narrative seduction and the power of fiction*. Retrieved from <https://muse.jhu.edu/book/32384>.
- Cheshire, J. (2000). The telling or the tale? Narratives and gender in adolescent friendship networks. *Journal of Sociolinguistics*, 4, 234-262. doi:10.1111/1467-9481.00113
- Colozzo, P., Morris, H., & Mirenda, P. (2015). Narrative production in children with autism spectrum disorder and specific language impairment. *Canadian Journal of Speech Language Pathology and Audiology*, 39, 316-332.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Pearson.
- Corbett, B. A., Constantine, L. J., Hendren, R., Rocke, D., & Ozonoff, S. (2009). Examining executive functioning in children with autism spectrum disorder, attention deficit hyperactivity disorder and typical development. *Psychiatry Research*, 166, 210-222. doi:10.1016/j.psychres.2008.02.005
- de Vries, M., Prins, P. J., Schmand, B. A., & Geurts, H. M. (2015). Working memory and cognitive flexibility-training for children with an autism spectrum disorder: A randomized controlled trial. *Journal of Child Psychology and Psychiatry*, 56, 566-576. doi:10.1111/jcpp.12324

- Diehl, J. J., Bennetto, L., & Young, E. C. (2006). Story recall and narrative coherence of high-functioning children with autism spectrum disorders. *Journal of Abnormal Child Psychology*, 34, 87-102. doi:10.1007/s10802-005-9003-x
- Dillenburger, K., & Keenan, M. (2009). None of the As in ABA stand for autism: Dispelling the myths. *Journal of Intellectual and Developmental Disability*, 34, 193-195. doi:10.1080/13668250902845244
- Dunn, L. M., & Dunn, D. M. (2007). *Peabody Picture Vocabulary Test: Fourth Edition (PPVT-4) [Assessment Instrument]*. Minneapolis, MN: Pearson Assessments.
- Eigsti, I., de Marchena, A. B., Schuh, J. M., & Kelley, E. (2011). Language acquisition in autism spectrum disorders: A developmental review. *Research in Autism Spectrum Disorders*, 5, 681-691. doi:10.1016/j.rasd.2010.09.001
- Eisenberg, A. R. (1985). Learning to describe past experiences in conversation. *Discourse Processes*, 8, 177-204. doi:10.1080/01638538509544613
- Engel, S. (1995). *The stories children tell: Making sense of the narratives of childhood*. New York, N.Y: W.H. Freeman.
- Estigarribia, B., Martin, G. E., Roberts, J. E., Spencer, A., Gucwa, A., & Sideris, J. (2011). Narrative skill in boys with fragile X syndrome with and without autism spectrum disorder. *Applied Psycholinguistics*, 32, 359-388. doi:10.1017/S0142716410000445
- Favot, K., Carter, M., & Stephenson, J. (2018a). The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study. *Journal of Developmental and Physical Disabilities*, 30, 615-637. doi:10.1007/s10882-018-9608-y
- Favot, K., Carter, M., & Stephenson, J. (2018b). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language impairment: A pilot



- study. *International Journal of Disability, Development and Education*, 492-509.  
doi:10.1080/1034912X.2018.1453049
- Favot, K., Carter, M., & Stephenson, J. (2019). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language disorder. *Journal of Behavioral Education*. doi:10.1007/s10864-019-09354-5
- Finestack, L. H. (2012). Five principles to consider when providing narrative language intervention to children and adolescents with developmental disabilities. *Perspectives on Language Learning and Education*, 19, 147-154. doi:10.1044/11e19.4.147
- Finestack, L. H., Palmer, M., & Abbeduto, L. (2012). Macrostructural narrative language of adolescents and young adults with Down syndrome or fragile X syndrome. *American Journal of Speech Language Pathology*, 21, 29-46. doi:10.1044/1058-0360(2011/10-0095)
- Fletcher-Watson, S., McConnell, F., Manola, E., & McConachie, H. (2014). Interventions based on the Theory of Mind cognitive model for autism spectrum disorder (ASD). *Cochrane Database Systematic Review*, 3, CD008785.  
doi:10.1002/14651858.CD008785.pub2
- Gamannossi, B. A., & Pinto, G. (2014). Theory of mind and language of mind in narratives: Developmental trends from kindergarten to primary school. *First Language*, 34, 262-272. doi:10.1177/0142723714535875
- Garnett, K. (1986). Telling tales: Narratives and learning-disabled children. *Topics in Language Disorders*, 6, 44-56. doi:10.1097/00011363-198603000-00006
- Gast, D. L., Lloyd, B. P., & Ledford, J. R. (2018). Multiple baseline and multiple probe designs. In J. R. Ledford & D. L. Gast (Eds.), *Single case research methodology: Applications in special education and behavioral sciences* (3rd ed.). New York, NY: Routledge.

- Genereux, R., & McKeough, A. (2007). Developing narrative interpretation: Structural and content analyses. *British Journal of Educational Psychology*, 77, 849-872.  
doi:10.1348/000709907x179272
- Gillam, R. B., & Pearson, N. A. (2017). *Test of Narrative Language: Second Edition (TNL-2) [Assessment Instrument]*. Austin, TX: Pro- ed.
- Gillam, S. L., Gillam, R. B., Fargo, J. D., Olszewski, A., & Segura, H. (2017). Monitoring indicators of scholarly language: A progress-monitoring instrument for measuring narrative discourse skills. *Communication Disorders Quarterly*, 38, 96-106.  
doi:10.1177/1525740116651442
- Gillam, S. L., Gillam, R. B., & Reece, K. (2012). Language outcomes of contextualized and decontextualized language intervention: Results of an early efficacy study. *Language Speech and Hearing Services in Schools*, 43, 276-291. doi:10.1044/0161-1461(2011/11-0022
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech Language and Hearing Research*, 58, 920-933. doi:10.1044/2015\_JSLHR-L-14-0295
- Goldman, S. (2008). Brief report: Narratives of personal events in children with autism and developmental language disorders: Unshared memories. *Journal of Autism and Developmental Disorders*, 38, 1982-1988. doi:10.1007/s10803-008-0588-0
- Green, L. B., & Klecan-Aker, J. S. (2012). Teaching story grammar components to increase oral narrative ability: A group intervention study. *Child Language Teaching and Therapy*, 28, 263-276. doi:10.1177/0265659012456029
- Hadwin, J., Baron Cohen, S., Howlin, P., & Hill, K. (1997). Does teaching theory of mind have an effect on the ability to develop conversation in children with autism. *Journal of Autism and Developmental Disorders*, 519-537. doi:10.1023/A:1025826009731

- Happé, F., & Frith, U. (2006). The weak coherence account: Detail-focused cognitive style in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 36, 5-25. doi:10.1007/s10803-005-0039-0
- Happé, F., Ronald, A., & Plomin, R. (2006). Time to give up on a single explanation for autism. *Nature Neuroscience*, 9, 1218-1220. doi:10.1038/nn1770
- Hedberg, N. L., & Westby, C. E. (1993). *Analyzing storytelling skills: Theory to practice*. Tuscon, AZ: The Psychological Corporation.
- Herman, D. (2007). Histories of narrative theory (I): A genealogy of early development. In J. Phelan & P. J. Rabinowitz (Eds.), *A companion to narrative theory* (pp. 19-35). Oxford, UK: Blackwell Publishing
- Hewitt, L. E. (2019). Narrative as a critical context for advanced language development in autism spectrum disorder. *Perspectives of the ASHA Special Interest Groups*, 4, 430-437. doi:10.1044/2019\_pers-sig1-2018-0021
- Hickman, M. (2003). *Children's discourse: Person, space and time across language*. London, England: Cambridge University Press.
- Hill, E. L. (2004). Executive dysfunction in autism. *Trends in Cognitive Sciences*, 8, 26-32. doi:10.1016/j.tics.2003.11.003
- Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. *Journal of Applied Behavior Analysis*, 11, 189-196.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71, 165-179. doi:10.1177/001440290507100203
- Hughes, D. L., McGillivray, L., & Schmidek, M. (1997). *Guide to narrative language: Procedures for assessment*. Eau Claire, WI: Thinking Publications.

- Humphrey, N. (2008). Including pupils with autistic spectrum disorders in mainstream schools. *Support for Learning*, 23, 41-47.
- Hyvarinen, M. (2008). Analyzing narratives and story-telling. In P. Alasuutari, L. Bickman & J. Brannen (Eds.), *The Sage handbook of social research methods* (pp. 447-460). Los Angeles, CA: Sage.
- Justice, L. M., Bowles, R. P., Kaderavek, J. N., Ukrainetz, T. A., Eisenberg, S. L., & Gillam, R. B. (2006). The index of narrative microstructure: A clinical tool for analyzing school-age children's narrative performances. *American Journal of Speech-Language Pathology*, 15, 177-191. doi:10.1044/1058-0360(2006/017)
- Kaderavek, J. (2015). *Language disorders in children: Fundamental concepts of assessment and intervention* (2nd ed.). Boston, MA: Pearson.
- Kalandadze, T., Norbury, C., Nærland, T., & Næss, K. B. (2018). Figurative language comprehension in individuals with autism spectrum disorder: A meta-analytic review. *Autism*, 22, 99-117. doi:10.1177/1362361316668652
- Kalmbach, J. (1980). *The structure of narrative retelling*. Retrieved from <http://files.eric.ed.gov/fulltext/ED216317.pdf>
- Kalmbach, J. R. (1986). Getting at the point of retellings. *Journal of Reading*, 29, 326-333. Retrieved from <http://www.jstor.org/stable/40031812>
- Karminloff-Smith, A. (1986). Some fundamental aspects of language development after 5. In P. Fletcher & M. Garman (Eds.), *Language Acquisition* (2nd ed., pp. 455-475). Cambridge, England: Cambridge University Press.
- Kauschke, C., & Klann-Delius, G. (1997). The acquisition of verbal expressions for internal states in German. A descriptive, explorative, longitudinal study. In S. Niewmeier & R. Dirven (Eds.), *The language of emotions: Conceptualization, expression, and*

- theoretical foundation* (pp. 173-194). Amsterdam, The Netherlands: John Benjamins Publishing.
- Kennedy, C. H. (1992). Trends in the measurement of social validity. *The Behavior Analyst*, 15, 147-156. doi:10.1007/BF03392597
- Kennedy, C. H. (2005). *Single case designs for educational research*. Boston, MA: Allyn and Bacon.
- Kenworthy, L., Anthony, L. G., Naiman, D. Q., Cannon, L., Wills, M. C., Luong-Tran, C., . . . Wallace, G. L. (2014). Randomized controlled effectiveness trial of executive function intervention for children on the autism spectrum. *Journal of Child Psychology and Psychiatry*, 55, 374-383. doi:10.1111/jcpp.12161
- King, D., Dockrell, J., & Stuart, M. (2014). Constructing fictional stories: A study of story narratives by children with autistic spectrum disorder. *Research in Developmental Disabilities*, 35, 2438-2449. doi:10.1016/j.ridd.2014.06.015
- Kjelgaard, M. M., & Tager - Flusberg, H. (2001). Language impairment in autism: Implications for genetic subgroups. *Language and Cognitive Processes*, 16, 287-308.
- Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. *What works clearinghouse*. Retrieved from <http://files.eric.ed.gov/fulltext/ED510743.pdf>
- Kristen, S., Vuori, M., & Sodian, B. (2015). "I love the cute caterpillar!" autistic children's production of internal state language across contexts and relations to joint attention and theory of mind. *Research in Autism Spectrum Disorders*, 12, 22-33. doi:10.1016/j.rasd.2014.12.006
- Labov, W., & Waletzky, J. (1997). Narrative analysis: Oral versions of personal experience. *Journal of Narrative and Life History*, 3-38.

- Lahey, M. (1988). *Language disorders and language development*. New York, NY: Collier Macmillan.
- Lander, R. (2012). *Teaching narrative structure to children with poor oral narrative skills in schools*. (Unpublished doctoral dissertation). Retrieved from Proquest Dissertations and Theses, University of Southampton, United Kingdom. (U639619).
- Lanser, S. S. (1986). Toward a feminist narratology. *Style*, 20, 341-363.  
doi:10.2307/42945612
- Liles, B. Z. (1993). Narrative discourse in children with language disorders and children with normal language: A critical review of the literature. *Journal of Speech, Language, and Hearing Research*, 36, 868-882. doi:10.1044/jshr.3605.868
- Lord, C., & Bishop, S. L. (2010). Autism spectrum disorders: Diagnosis, prevalence and services for children and families. *Social Policy Report*, 24, 1-27. doi:10.1002/j.2379-3988.2010.tb00063.x
- Losh, M., & Capps, L. (2003). Narrative ability in high-functioning children with autism or Asperger's syndrome. *Journal of Autism and Developmental Disorders*, 33, 239-251.  
doi:10.1023/A:1024446215446
- Loveland, K., & Tunali, B. (1993). Narrative language in autism and the theory of mind hypothesis: A wider perspective. In S. Baron Cohen, H. Tager - Flusberg, & D. Cohen (Eds.), *Understanding other minds: Perspectives from autism* (pp. 247-266). Oxford, England: Oxford University Press.
- Mandler, J. M., & Johnson, N. S. (1977). Remembrance of things parsed: Story structure and recall. *Cognitive Psychology*, 9, 111-151. doi:10.1177/002383097702000303
- May, T., Sciberras, E., Brignell, A., & Williams, K. (2017). Autism spectrum disorder: Updated prevalence and comparison of two birth cohorts in a nationally representative Australian sample. *BMJ Open*, 7, e015549. doi:10.1136/bmjopen-2016-015549

- Mayer, M. (1980). *Frog, where are you?* New York, NY: Pied Piper.
- Mayer, M. (2007). *A boy, a dog, and a frog*. New York, NY: Penguin Putnum Inc.
- McCabe, A. (1991). Preface: Structure as a way of understanding. In A. McCabe & C. Peterson (Eds.), *Developing narrative structure* (pp. X-XVII). Hillsdale, NJ: Lawrence Erlbaum Associates.
- McCabe, A., Bliss, L., Barra, G., & Bennett, M. (2008). Comparison of personal versus fictional narratives of children with language impairment. *American Journal of Speech-Language Pathology*, 17, 194-206. doi:10.1044/1058-0360(2008/019)
- McCabe, A., & Rollins, P. R. (1994). Assessment of preschool narrative skills. *American Journal of Speech-Language Pathology*, 3, 45-56. doi:10.1044/1058-0360.0301.45
- Miyake, A., & Friedman, N. P. (2012). The nature and organization of individual differences in executive functions: Four general conclusions. *Current Directions in Psychological Science*, 21, 8-14. doi:10.1177/0963721411429458
- Morrow, L. M. (1985). Retelling stories: A strategy for improving young children's comprehension, concept of story structure, and oral language complexity. *The Elementary School Journal*, 85, 647-661. doi:10.1086/461427
- Nicholas, J. S., Charles, J. M., Carpenter, L. A., King, L. B., Jenner, W., & Spratt, E. G. (2008). Prevalence and characteristics of children with autism-spectrum disorders. *Annals of Epidemiology*, 18, 130-136. doi:10.1016/j.annepidem.2007.10.013
- Nicolopoulou, A., & Trapp, S. (2018). Narrative interventions for children with language disorders: A review of practices and findings. In A. Bar-On & R. Dorit (Eds.), *Handbook of communication disorders: Theoretical, empirical, and applied linguistic perspectives* (pp. 270-288). Boston, MA: De Gruyter Mouton.

- Norbury, C. F., & Bishop, D. V. (2003). Narrative skills of children with communication impairments. *International Journal of Language and Communication Disorders*, 38, 287-313. doi:10.1080/136820310000108133
- Norbury, C. F., Gemmell, T., & Paul, R. (2014). Pragmatics abilities in narrative production: A cross-disorder comparison. *Journal of Child Language*, 41, 485-510. doi:10.1017/S030500091300007X
- Nuske, H. J., & Bavin, E. L. (2011). Narrative comprehension in 4-7-year-old children with autism: Testing the weak central coherence account. *International Journal of Language and Communication Disorders*, 46, 108-119. doi:10.3109/13682822.2010.484847
- Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. H., Thompson, B., & Harris, K. R. (2005). Research in special education: Scientific methods and evidence-based practices. *Exceptional Children*, 71, 137-148.
- Owens, R. E., Jr. (2016). *Language development: An introduction* (9th ed.). Upper Saddle River, NJ: Pearson.
- Ozonoff, S. (1994). A longitudinal study of executive function and theory of mind development in autism. *Development and Psychopathology*, 6, 415-431. doi:10.1017/S0954579400006027
- Ozonoff, S., & Jensen, J. (1999). Brief report: Specific executive function profiles in three neurodevelopmental disorders. *Journal of Autism and Developmental Disorders*, 29, 171-177. doi:10.1023/A:1023052913110
- Ozonoff, S., Pennington, B. F., & Rogers, S. J. (1991). Executive function deficits in high-functioning autistic individuals: Relationship to theory of mind. *Journal of Child Psychology and Psychiatry*, 32, 1081-1105. doi:10.1111/j.1469-7610.1991.tb00351.x



- Paley, V. G. (1990). *The boy who would be a helicopter*. Cambridge, MA: Harvard University Press.
- Paul, R., Augustyn, A., Klin, A., & Volkmar, F. R. (2005). Perception and production of prosody by speakers with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 35, 205-220. doi:10.1007/s10803-004-1999-1
- Paul, R., Orlovski, S. M., Marcinko, H. C., & Volkmar, F. (2009). Conversational behaviors in youth with high-functioning ASD and Asperger syndrome. *Journal of Autism and Developmental Disorders*, 39, 115-125. doi:10.1007/s10803-008-0607-1
- Petersen, D. B., Gillam, S. L., & Gillam, R. B. (2008). Emerging procedures in narrative assessment: The index of narrative complexity. *Topics in Language Disorders*, 28, 115-130. doi:10.1097/01.TLD.0000318933.46925.86
- Petersen, D. B. (2011). A systematic review of narrative-based language intervention with children who have language impairment. *Communication Disorders Quarterly*, 32, 207-220. doi:10.1177/1525740109353937
- Petersen, D. B., Brown, C. L., Ukrainetz, T. A., Wise, C., Spencer, T. D., & Zebre, J. (2014). Systematic individualized narrative language intervention on the personal narratives of children with autism. *Language, Speech, and Hearing Services in Schools*, 45, 67-86. doi:10.1044/2013\_LSHSS-12-0099
- Petersen, D. B., Gillam, S. L., Spencer, T., & Gillam, R. B. (2010). The effects of literate narrative intervention on children with neurologically based language impairments: An early stage study. *Journal of Speech, Language, and Hearing Research*, 53, 961-981. doi:10.1044/1092-4388(2009/09-0001)
- Peterson, C., Jesso, B., & McCabe, A. (1999). Encouraging narratives in preschoolers: An intervention study. *Journal of Child Language*, 26, 49-67. doi:10.1017/S0305000998003651

- Peterson, C., & McCabe, A. (1991). Linking children's connective use and narrative macrostructure. In C. Peterson & A. McCabe (Eds.), *Developing narrative structure* (pp. 29-54). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc. Retrieved from <http://psycnet.apa.org/psycinfo/1991-97747-001>
- Peterson, C., & McCabe, A. (1983). *Developmental psycholinguistics: Three ways of looking at a child's narrative*. New York, NY: Plenum.
- Phelan, J. (1996). *Narrative as rhetoric: Technique, audiences, ethics, ideology*. Columbus, OH: Ohio State University Press. Retrieved from <https://ohiostatepress.org/books/BookPages/PhelanNarrative.htm>
- Phelan, J., & Rabinowitz, P. J. (2008). Introduction: Tradition and innovation in contemporary narrative theory. In J. Phelan & P. J. Rabinowitz (Eds.), *A companion to narrative theory* (pp. 1-16). Malden, MA: Blackwell Publishing.
- Phelan, J., & Rabinowitz, P. J. (2012). Introduction: Narrative as rhetoric. In D. Herman, J. Phelan, P. J. Rabinowitz, B. Richardson, & R. Warhol (Eds.), *Narrative theory: Core concepts & critical debates* (pp. 3-8). Columbus, OH: The Ohio State University Press.
- Plavnick, J. B., & Ferreri, S. J. (2013). Single-case experimental designs in educational research: A methodology for causal analyses in teaching and learning. *Educational Psychology Review*, 25, 549-569. doi:10.1007/s10648-013-9230-6
- Polanyi, L. (1985). *Telling the American story*. Norwood, NJ: Ablex.
- Preece, A. (1987). The range of narrative forms conversationally produced by young children. *Journal of Child Language*, 14, 353-373. doi:10.1017/S0305000900012976
- Premack, D., & Woodruff, G. (1978) *The Behavioral and Brain Sciences*, 4, 515-526.
- Prince, G. (1997). Narratology and narratological analysis. *Journal of Narrative and Life History*, 7, 39-44.

- Propp, V. (1968). *The morphology of the folktale* (2nd ed.). Austin, TX: University of Texas Press.
- Reese, E., & Newcombe, R. (2007). Training mothers in elaborative reminiscing enhances children's autobiographical memory and narrative. *Child Development*, 78, 1153-1170. doi:10.1111/j.1467-8624.2007.01058.x
- Richardson, B. (2000). Recent concepts of narrative and the narratives of narrative theory. *Style*, 34, 168-175.
- Rimmon-Kenan, S. (2003). *Narrative fiction: Contemporary poetics*. London, United Kingdom: Routledge.
- Rumelhart, D. E. (1975). Notes on a schema for stories. In D. G. Bobrow & A. Collins (Eds.), *Representation and understanding: Studies in cognitive science* (pp. 211-236). New York, NY: Academic Press, Inc.
- Rumpf, A. L., Kamp-Becker, I., Becker, K., & Kauschke, C. (2012). Narrative competence and internal state language of children with Asperger syndrome and ADHD. *Research in Developmental Disabilities*, 33, 1395-1407. doi:10.1016/j.ridd.2012.03.007
- Schank, R., & Abelson, R. (1977). *Scripts, plans, goals, and understanding: An inquiry into human knowledge structure*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Schlosser, R. W., Wendt, O., & Sigafos, J. (2007). Not all systematic reviews are created equal: Considerations for appraisal. *Evidence-Based Communication Assessment and Intervention*, 1, 138-150.
- Shiro, M. (2003). Genre and evaluation in narrative development. *Journal of Child Language*, 30, 165-195. doi:10.1017/S0305000902005500
- Shu, B., Lung, F., Tien, A. Y., & Chen, B. (2001). Executive function deficits in non-retarded autistic children. *Autism*, 5, 165-174. doi:10.1177/1362361301005002006

- Siller, M., Swanson, M. R., Serlin, G., & George, A. (2014). Internal state language in the storybook narratives of children with and without autism spectrum disorder: Investigating relations to theory of mind abilities. *Research in Autism Spectrum Disorders*, 8, 589-596. doi:10.1016/j.rasd.2014.02.002
- Sinzig, J., Morsch, D., Bruning, N., Schmidt, M. H., & Lehmkuhl, G. (2008). Inhibition, flexibility, working memory and planning in autism spectrum disorders with and without comorbid ADHD-symptoms. *Child and Adolescent Psychiatry and Mental Health*, 2, 1-12. doi:10.1186/1753-2000-2-4
- Sng, C. Y., Carter, M., & Stephenson, J. (2018). A systematic review of the comparative pragmatic differences in conversational skills of individuals with autism. *Autism & Developmental Language Impairments*, 3, 239694151880380. doi:10.1177/2396941518803806
- Spencer, T. D., Kajian, M., Petersen, D. B., & Bilyk, N. (2013). Effects of an individualized narrative intervention on children's storytelling and comprehension skills. *Journal of Early Intervention*, 35, 243-269. doi:10.1177/1053815114540002
- Spencer, T. D., & Petersen, D. B. (2010). *Test of Narrative Retell: Preschool (TNR:P) [Assessment Instrument]*. Retrieved from <http://www.languagedynamicsgroup.com/tnr.html>
- Spencer, T. D., & Petersen, D. B. (2012). *Story Champs: A multi-tiered language intervention program*. Laramie, WY: Language Dynamics Group. Retrieved from <http://www.languagedynamicsgroup.com>
- Spencer, T. D., & Petersen, D. B. (2018). Bridging oral and written language: An oral narrative language intervention study with writing outcomes. *Language Speech and Hearing Services in Schools*, 49, 569-581. doi:10.1044/2018\_lshss-17-0030

- Sperry, L. L., & Sperry, D. E. (1996). Early development of narrative skills. *Cognitive Development, 11*, 443-465. doi:10.1016/S0885-2014(96)90013-1
- Stadler, M. A., & Ward, G. C. (2006). Supporting the narrative development of young children. *Early Childhood Education Journal, 33*, 73-80. doi:10.1007/s10643-005-0024-4
- Stein, N. L., & Glenn, C. G. (1978). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), *New directions in discourse processing* (pp. 53 - 120). Norwood, NJ: Ablex Publishing Corporation.
- Stirling, L., Douglas, S., Leekam, S., Carey, L., Arciuli, J., & Brock, J. (2014). The use of narrative in studying communication in autism spectrum disorders. In *Communication in autism, trends in language acquisition research* (pp. 169-216). Amsterdam, The Netherlands: John Benjamins Publishing Company.
- Suh, J., Eigsti, I. M., Naigles, L., Barton, M., Kelley, E., & Fein, D. (2014). Narrative performance of optimal outcome children and adolescents with a history of an Autism Spectrum Disorder (ASD). *Journal of Autism and Developmental Disorders, 44*, 1681-1694. doi:10.1007/s10803-014-2042-9
- Tager-Flusberg, H. (1995). 'Once upon a rabbit': Stories narrated by autistic children. *British Journal of Developmental Psychology, 13*, 45-59. doi:10.1111/j.2044-835X.1995.tb00663.x
- Thorndyke, P. W. (1977). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive Psychology, 9*, 77-110. doi:10.1016/0010-0285(77)90005-6
- Todorov, T. (1971). The 2 principles of narrative. *Diacritics, 1*, 37-44. Retrieved from <http://www.jstor.org/stable/464558>
- Ukrainetz, T. A., Justice, L. M., Kaderavek, J. N., Eisenberg, S. L., Gillam, R. B., & Harm, H. M. (2005). The development of expressive elaboration in fictional narratives.

*Journal of Speech Language and Hearing Research*, 48, 1363-1377. doi:10.1044/1092-4388(2005/095)

Warhol, R. (2012). Introduction: A feminist approach to narrative. In D. Herman, J. Phelan, & P. J. Rabinowitz (Eds.), *Narrative theory: Core concepts and critical debates* (pp. 9-13). Columbus, OH: Ohio State University Press.

Westby, C. (1991). Learning to talk, talking to learn: Oral literate language differences. In C. S. Simon (Ed.), *Communication skills and classroom success* (pp. 334-357). Eau Claire, WI : Thinking Publications.

What Works Clearinghouse. (2017). *Standards Handbook Version 4.0*. Retrieved from <https://ies.ed.gov/ncee/wwc/Handbooks#procedures>

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, 11, 203-214.

Woolley, J. D., & Cox, V. (2007). Development of beliefs about storybook reality. *Developmental Science*, 10(5), 681-693. doi:10.1111/j.1467-7687.2007.00612.x

## **Chapter 2: The effects of oral narrative intervention on the narratives of children with language disorder: A systematic literature review**

### **Chapter Overview**

This chapter consists of a manuscript, “The effects of oral narrative intervention on the narratives of children with language disorder: A systematic literature review”. The manuscript is currently under review in a peer reviewed journal. This review extends and updates an earlier review conducted by Petersen (2011). It represents the most comprehensive conducted to date and includes more detailed analysis of quality as well as well as more sophisticated single case effect size analysis. The single case research was generally found to be of good quality. The group studies were generally of low quality and only four included comparison groups. Effect sizes were calculated on the data provided in the single case research studies and overall effect sizes for macrostructure was moderate and was lower for microstructure. Measured effect sizes for the group studies were uneven. A small group of common features were found to be used in successful interventions and included the use of macrostructure icons, visuals to represent narratives, clinician modelling of narrative and participants being provided with an opportunity to tell an entire narrative each intervention session. Future research should include more robust research designs, intervention delivered in groups, participants with a wider range of disabilities and more investigation into the effect of intervention on personal narratives.

### **References**

Petersen, D. B. (2011). A systematic review of narrative-based language intervention with children who have language impairment. *Communication Disorders Quarterly*, 32, 207-220. doi:10.1177/1525740109353937

### **Publication Status**

Favot, K., Carter, M., & Stephenson, J. (2019). The effects of oral narrative intervention on the narratives of children with language disorder: A systematic literature review.  
Manuscript under review.



The effects of oral narrative intervention on the narratives of children with language disorder:

A systematic literature review

Kate Favot, Mark Carter and Jennifer Stephenson

Macquarie University

Kate Favot <sup>a1</sup>, Mark Carter <sup>a2</sup>, Jennifer Stephenson <sup>a2</sup>

<sup>a</sup> Macquarie University Special Education Centre, Macquarie University, Sydney, NSW,

2109 Australia, <sup>1</sup> Masters of Research, <sup>2</sup> Doctor of Philosophy

kate.favot@mq.edu.au

mark.carter@mq.edu.au

jennifer.stephenson@mq.edu.au

Correspondence concerning this article should be addressed to

Kate Favot, Macquarie University Special Education Centre, Sydney, NSW, 2109 Australia

Email: kate.favot@mq.edu.au

**Disclosure of potential conflicts of interests:** The authors declare that they have no conflict of interest. The authors declare that they do not have any financial or other nonprofessional benefits associated with this research.

**Ethics:** Ethics approval was not required for this research.

## Abstract

**Purpose:** This systematic review provides an examination of the quality, efficacy and common features of oral narrative interventions on the narratives of children with language disorder.

**Method:** Searches of electronic data bases, ancestral searches and database alerts identified studies that addressed oral narrative intervention in children with language disorder. Structured inclusion procedures were used to select and examine the quality, efficacy and common features of the included studies.

**Results:** Twenty-five research articles published between 1993 and 2018 were included for review. Apart from measures of social validity, the single case research studies were generally of good quality and results can be interpreted with confidence. The group studies were generally of low quality and only four included comparison groups. Single case effects sizes for macrostructure were moderate with lower effect sizes for microstructure. The results for group studies were mixed. Successful interventions included the use of icons, visuals, clinician modelling and the participants being provided with an opportunity to state an entire narrative each intervention session.

**Conclusion:** Oral narrative intervention to develop the narratives of children with language disorder may be effective. Areas for future research were identified and include more robust research designs, intervention being delivered to participants in groups, conducting intervention with participants with more significant disabilities, more research conducted with personal narrative, and including more generalization measures.

Narratives are accounts of past, future or imagined events (Segal & Pesco, 2015). They begin to emerge from around two years of age (Allen, Kertoy, Sherblom, & Pettit, 1994), and are the first extended monologic discourse (Hedberg & Westby, 1993). Narratives are a major milestone in language development as they represent a transition from contextualized language based in the 'here and now' to decontextualized language based in the 'there and then' (Brown, 1973).

Oral narratives can take a variety of forms. Personal narratives describe and evaluate events that have been individually or vicariously experienced (Preece, 1987). They include scripts of regularly occurring events (Shiro, 2003), recounts of specific, but unremarkable events (Polanyi, 1985), and classic high point personal narratives which revolve around a problem and a climax (McCabe & Rollins, 1994). Fictional narrative retells are retellings of existing narratives to illustrate understanding (Kalmbach, 1986) or to share the narrative with others. Original fictional narratives are unique texts, based in reality or fantasy, in which the narrator gets to create a world of their own liking (Engel, 1995). The western academic culture however, often requires students to generate original narratives in response to provided stimuli (Gillam & Pearson, 2017).

Narratives have been called a bridge between oral language and literacy (Westby, 1991) as they are a naturalistic way of organizing abstract thinking, complex language and sequencing (Petersen, 2011). An individual's capacity to generate narrative has been broadly linked with social (Cheshire, 2000), and academic (Spencer & Petersen, 2018) development. Narratives are the direct goal of instruction in mainstream western schools, with curricula in England, (Department of Education, 2014) and Australia, (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2016) and the common core standards in the United States (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010) requiring students to be able to generate narratives from

the early primary years. In addition, narratives are commonly used in both school based (Bloome, Katz, & Champion, 2003) and external assessments (Caldwell & White, 2017). The capacity to generate narratives has also been correlated with the development of wider literacy based academic skills (Hughes, McGillivray, & Schmidek, 1997), such as reading comprehension (Morrow, 1985), and writing (Spencer & Petersen, 2018).

Mainstream western academic culture values narratives that are structured according to conventions of macrostructure (Petersen, Gillam, Spencer, & Gillam, 2010), which has been found to guide the understanding and generation of narrative (Hickman, 2003).

Macrostructure consists of a set of elements that must be included in a narrative and provide rules about the order of those components (Brewer & Lichtenstein, 1980). Macrostructure elements noted as essential for narrative include *setting* (including *character*), *initiating event*, *internal response*, *internal plan*, *attempt*, *direct consequence*, and *reaction* (Stein & Glenn, 1978). Researchers have asserted that the macrostructure information is the crucial and definitional component of narrative (Peterson & McCabe, 1991). The accurate use of microstructure within a narrative may support the clarity of information presented within macrostructure elements. Narrative microstructure includes measures of productivity, such as number of words and number of different words, and measures of complexity, such as coordinating and subordinating conjunctions (Justice et al., 2006).

Generating narratives places great cognitive and linguistic demands on the speaker (Botting, 2002). Children with range of communication disabilities have been found to have difficulties generating narratives and may produce narratives with impaired macrostructure (Baixauli, Colomer, Roselló, & Miranda, 2016; Colozzo, Gillam, Wood, Schnell, & Johnston, 2011; Estigarribia et al., 2011; Marini, Martelli, Gagliardi, Fabbro, & Borgatti, 2010; Soto, Yu, & Kelso, 2008). Given the importance of narratives to literacy and academic progress and that problems do not necessarily resolve without instruction (Fey, Catts,

Proctor-Williams, Tomblin, & Zhang, 2004) they are often identified as a focus for language assessment and intervention (Bliss & McCabe, 2008; Kaderavek, 2015; McCabe & Bliss, 2005; Owens, Jr., 2016).

Petersen (2011) conducted a systematic review of the research that investigated the efficacy and quality of oral narrative intervention with children who have language impairment, learning and/or language disabilities, and comorbid neurological and language impairments. Nine studies were included in the review. Researchers investigated the effect of intervention on fictional narrative retell in two studies, on original fictional narratives in six studies and both retell and generation outcomes were measured in one study. Petersen (2011) concluded that the studies implemented a wide range of narrative intervention strategies and materials but interventions that included pictures or books to elicit narratives, icons or cards to represent individual macrostructure concepts, and participants being provided with opportunities to tell entire narratives each session may assist narrative development in children with language impairments.

Research into the effects of oral narrative intervention on the narratives of children with language disorder is a developing area and several papers have been published since Petersen's (2011) review. This current review extends and updates Petersen's review as it includes more detailed analysis of quality and more sophisticated single case effect size analysis. Given the importance of narrative, the potential benefit of intervention and the growth of narrative intervention as a research area, the following questions will be addressed in this review:

1. What are the common features of oral narrative interventions with children with language disorder?
2. What is the quality of oral narrative intervention research conducted with children with language disorders?

### 3. How effective are oral narrative interventions for children with language disorder?

## **Method**

### **Identification of Studies**

The process of identifying articles is summarized in a PRISMA flowchart in Figure 1. Searches were conducted of the following electronic databases: CINHAL, Education Research Complete, PsycINFO, Eric Proquest, Scopus, and American Doctoral Dissertations. Combinations of the following search terms were used: narrative intervention OR oral narrative intervention OR narrative based language intervention, and language disorder OR at risk of language disorder, AND children. No restriction was placed on date of publication or language.

The titles and abstracts of these articles were examined and included if they met the following criteria: refereed journal article or thesis at Masters level or above; written in English; participants between birth and 18 years of age; dependent variables related to oral narrative development were measured; an oral narrative intervention was implemented; participants had a stated communication disorder or a disability known to affect communication (e.g., autism spectrum disorder, Williams Syndrome) or participants were explicitly stated to be at risk or were enrolled in a program for at risk children (e.g., Head Start). While the focus of the review was on students with language impairment, studies including at risk participants were retained at the abstract screening stage as participant descriptions in the abstracts were often limited. Where it was not clear from the abstract and title that criteria were met, studies were retained for examination of the full text.

Ancestral searches were conducted on the articles identified in the screening. The full text of each of the remaining articles, plus articles identified from ancestral searches and database alerts was obtained and reviewed. Articles were retained if they met the criteria

listed above, but article that only included participants at risk were excluded. If the intervention included participants with both language disorder and language within normal limits, the study was included if data for the participants with language disorder could be isolated. One article was discarded that provided an English abstract, but was written in a language other than English, one was discarded due to a lack of clarity around participant diagnoses, and a further article was discarded after clarification from the corresponding author that despite some low language test scores participants were considered to be “at risk” of language disorder, rather than having a diagnosed language disorder (Spencer, Kajian, Petersen, & Bilyk, 2013). Twenty-five studies met the final inclusion criteria.

### **Data Extraction**

Information was extracted relevant to: research design; participant profile (number, gender, age, diagnosis); dependent variables (macrostructure, microstructure, combined measure, or other); class of narrative (personal, fictional retell, original fictional narrative); stimulus for data collection (e.g., photos, story, picture sequence); data collection schedule for single case studies (before or after intervention sessions); service delivery (group size, location, frequency and length of session, number of sessions, total intervention time); maintenance and generalization (across people, places, story types); and treatment fidelity data. Strategies and materials used within the interventions were also extracted for all studies. Authors in some studies investigated variables that did not relate to oral narrative intervention and, for the purposes of this review, only data that related to the effects of oral narrative intervention on narratives were extracted from the studies.

The single case research studies were appraised for quality using two rating scales. The Council of Exceptional Children (CEC) based quality rating criteria was formulated using guidelines established by Horner et al. (2005) and was further operationalized by Reynhout and Carter (Reynhout & Carter, 2011). Quality was evaluated for description of participants

and setting, description of the dependent and independent variables, baseline conditions and characteristics, experimental control, external validity and social validity. Each category was given a numerical score from a maximum of ten points, except for external validity where the maximum score was five points. The total maximum score for article quality was 65 points, with higher points indicating higher overall quality.

The single case research designs were also evaluated to establish standard of evidence using the What Works Clearinghouse (WWC) design and evidence standards protocol (What Works Clearinghouse, 2017). The protocol is used to determine if a study's design meets evidence standards, meets standards with reservations, or does not meet standards.

Single group pretest posttest studies are fundamentally uninterpretable with regard to casual influence (Campbell & Stanley, 1963) and therefore were not evaluated for quality. Group studies that included comparison groups were evaluated for quality using a quality criteria assessment protocol devised by Leong et al. (2015) with additional criteria based on the Cochrane handbook (Higgins & Green, 2011). Group comparison studies were rated for quality according to five criteria; random allocation of participants to groups, pre-test equivalence of groups, blinding of assessors to group allocation, attrition rates and completeness of data sets. Each of the five criteria were scored out of a possible 2 points with a maximum possible score of 10.

### **Effect Size Measures**

**Single case studies.** A wide variety of effect size measures have been proposed for single case research. Nonoverlap based metrics address concerns with parametric assumptions (Carter, 2013; Parker, Vannest, & Davis, 2011) and have been widely applied. The strength of conclusions regarding efficacy of an intervention are strengthened when multiple approaches converge on the same conclusion (Preston & Carter, 2009) so both PND and BC-Tau were used in the analysis of single-case research in the present study.



Percentage of nonoverlapping data (PND) is a commonly used measure and offers the advantage of the availability of an extensive comparative database. Mastropieri, Scruggs, Bakken, and Whedon (1996) have suggested that PND between 0 and 50 indicates an ineffective intervention, between 51 and 70 mildly effective, 71 and 90 moderately effective, and 91 and 100 indicates a highly effective intervention.

Despite its wide use, PND has a number of significant limitations including an inability to correct for baseline trend. Tau-U is an alternative measure that has gained some acceptance and has the potential to control monotonic baseline trend (Parker, Vannest, Davis, & Sauber, 2011). However, a number of limitations of Tau-U have been identified including calculation anomalies that can yield results outside the theoretical bounds of the measure (-1 to +1) (Brossart, Laird, & Armstrong, 2018; Tarlow, 2017) and, of particular concern, weak correction for baseline trend that can inflate effect sizes (Tarlow, 2017). Baseline corrected tau (BC-Tau) has been proposed as an alternative measure and it uses the nonparametric Theil–Sen estimator to robustly correct baseline trend (Tarlow, 2017). There appear to be no specific guidelines for interpretation of BC-Tau but, given its close relationship with Tau-U, the general standards suggested by Vannest and Ninci (2015) have been adopted here. That is 0.20 is considered small, 0.20 to 0.60 is considered moderate, 0.60 to 0.80 large and above 0.80 very large.

To enable PND and BC-Tau to be calculated the first researcher retrieved and recorded all data points, either manually or using Graphclick (Arizona Software Inc, 2012), for all dependent variables in each study. All manually retrieved data was double checked.

The percentage of non-overlapping data (PND) was calculated by the first author for all dependent variables that related to narrative production, even if PND was reported by the authors of a study. PND was calculated using guidelines provided by Scruggs and Mastropieri (1998). All dependent variables in each study were then classified as either

macrostructure, microstructure, combined (a single measure that includes both macrostructure and microstructure), or other (episode levels were examined in a single study). The first author then calculated an average PND for each classification (macrostructure, microstructure, combined) in each study. Scruggs and Mastropieri (1998) have indicated that PND is not an appropriate metric when ceiling effects or baseline data are rising. PND was then recalculated with data sets that contained rising baselines and ceiling data points removed.

BC-Tau was also calculated for all dependent variables that related to narrative production. A BC-Tau score was calculated for each study for macrostructure, microstructure, and combined measures using a web-based BC-Tau calculator (Tarlow, 2016). Where statistically significant baseline trend was indicated, baseline correction was applied. In order to calculate an omnibus effect size, BC-Tau correlations and standard errors were entered into the Comprehensive Meta-analysis program (Borenstein, Hedges, Higgins, & Rothstein, 2005) and study level effect sizes were calculated. Studies were weighted using the inverse variance method. Hedges' *g* was used as the effect size metric. Given the diversity of participants included in the studies examined and variety of outcome measures, an a priori decision was made to employ a random effects analysis (Borenstein, Hedges, Higgins, & Rothstein, 2009). Heterogeneity was examined to determine the extent to which variance could be attributed to true variation between studies versus random error.

**Group Studies.** For group studies with comparison groups, Hedges' *g* was calculated for relevant contrasts where possible. Hedges' *g* was considered the preferred outcome metric as it includes a correction for small sample bias (Borenstein, Hedges, Higgins, & Rothstein, 2009).

## **Reliability**

**Article selection.** The second or third author independently reviewed each title and abstract to enable reliability of initial article selection to be assessed. Reliability was calculated by dividing agreements by agreements plus disagreements and multiplying by 100. Reliability of initial article selection was 95% with disagreements being resolved by discussion. The first author evaluated all of the full text articles and the second or third author independently reviewed half of the articles each. Reliability for article inclusion was calculated by dividing agreements by agreements plus disagreements and multiplying by 100 and was 89%. Disagreements were resolved by discussion.

**Data Extraction.** The first author and either the first or second author independently extracted information and appraised each study. Reliability for data extraction and quality appraisal was calculated by dividing agreements by agreements plus disagreements and multiplying by 100. Reliability for single case research data extraction was 93% (range 83% - 100%), the CEC based quality rating criteria quality 87% (range 75% - 100%) and for WWC quality was 94% (range 70% - 100%). Reliability for group research data extraction was 89% (range 84% - 96%) and for group research quality was 90% (range 80% - 90%). All disagreements were resolved by discussion.

**Single case effect sizes.** The second author conducted PND and BC-Tau reliability on all dependent variables in 20% of randomly selected single case research studies. Reliability was calculated by dividing agreements by agreements plus disagreements and multiplying by 100 and was 100%. The first and third authors separately evaluated all data sets for rising baselines and ceiling data points in baseline. Reliability for rising baselines was 94% and for ceiling data points was 100%. Disagreements were resolved by discussion.

## **Results**

Twenty-five studies met the criteria for narrative intervention with children with language disorder. Eleven single case research studies, 11 group research studies, one study that included both single case and group data, and two case studies were included for review.

### **Case Studies**

Gillam and Gillam (2016) investigated the effects of narrative intervention on narrative retells and original fictional narratives. One 10 year old male diagnosed with language disorder participated in the intervention that targeted a combined measure of macrostructure and microstructure and the participant's capacity to tell a narrative from different perspectives. Klecan-Aker (1993) measured the effects of intervention on the original fictional narratives of an 8 year 8-month-old male with language disorder on measures of macrostructure and microstructure. Researchers reported that case study interventions were successful.

### **Single Case Research**

**Participants.** A summary of participant information is provided in Table 1. The single case research included 53 participants (25 female, 28 male) with a mean age of 7 years 10 months, (range 4 years 8 months to 15 years 4 months). Communication skills were documented with standardized test results for 41 participants in eight studies and participants were described as having severe language disorder (Favot, Carter, & Stephenson, 2018a; Favot, Carter, & Stephenson, 2018b), moderate language disorder (Gillam, Hartzheim, Studenka, Simonsmeier, & Gillam, 2015; Gillam et al., 2018; Hayward & Schneider, 2000; Petersen et al., 2010; Shelton, 1999; Spencer et al., 2013) and mild language disorder (Gillam et al., 2018; Gillam et al., 2015). Participants were described as being language delayed according to conversational and narrative analysis by authors in one study (Petersen et al., 2014), as being language impaired but with no supporting documentation by authors in another study (Miller, Correa, & Katsiyannis, 2018) and one study included participants with

diagnoses associated with language and communication difficulties ( i.e., pervasive developmental disorder; Klecan-Aker & Gill, 2005).

Seventeen of the 53 participants in six studies were described as having a diagnosis of autism spectrum disorder (ASD), autism or pervasive developmental disorder. Ten participants in three studies were diagnosed according to criteria set in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Ed (DSM-IV; American Psychiatric Association, 2000) or Diagnostic and Statistical Manual of Mental Disorders, Fifth Ed (DSM 5; American Psychiatric Association, 2013), five participants in one study had received educational diagnoses of autism (Gillam et al., 2015), two participants in two studies were described as having a diagnosis of pervasive developmental disorder or ASD but with no additional information.

Verbal or non-verbal cognitive functioning was described in eight studies. Twelve participants in three studies were reported as presenting with below average verbal or non-verbal performance on standardized tests of cognitive functioning (Favot et al., 2018a; Favot et al., 2018b; Finestack, O'Brien, Hyppa-Martin, & Lyrek, 2017), and 25 participants in five studies were reported as having nonverbal intelligence within normal limits according to the results of standardized tests (Gillam et al., 2015; Gillam et al., 2018; Hayward & Schneider, 2000; Petersen et al., 2010; Shelton, 1999).

Existing oral narrative skills were assessed using a standardized and norm referenced measure of narrative ability in four studies. The Test of Narrative Language (TNL; Gillam & Pearson, 2004) was used by researchers in three studies (Finestack et al., 2017; Gillam et al., 2018; Petersen et al., 2010) and The Renfrew Bus Story was used by researchers in one study (Cowley & Glasgow, 1994). Fourteen of the 15 participants in those studies performed below age expectations on measures of narrative ability. Narrative skills were assessed using experimenter developed narrative screeners in three studies (Favot et al., 2018a; Favot et al.,

2018b; Gillam et al., 2015), and all participants were reported by authors to not include all narrative elements targeted in intervention.

**Dependent variables.** A summary of information that relates to the dependent variables is provided in Table 2. Macrostructure was coded as a dependent variable in eight studies, seven of those studies utilized a composite macrostructure score and researchers in one study investigated the effect of intervention on individually targeted macrostructure components (Petersen et al., 2014). Measures of microstructural complexity (e.g., subordinating conjunctions) and or productivity (e.g., total number of words) were coded as a dependent variable in eight studies. Microstructural productivity was measured across more elements and in more studies than microstructural complexity with total number of words the single most frequently measured microstructural element. Combined macrostructure and microstructure scores were coded in five studies and researchers used the Index of Narrative Complexity (INC; Petersen, Gillam, & Gillam, 2008) in two studies, Monitoring Indicators of Scholarly Language (MISL; Gillam, Gillam, Fargo, Olszewski, & Segura, 2017) was used in two studies and the Test of Narrative Retell subtest of the Narrative Language Measures (Petersen & Spencer, 2012) was used in one study. Researchers in five studies collected data immediately before the intervention session (Favot et al., 2018a; Favot et al., 2018b; Finestack et al., 2017; Miller et al., 2018; Spencer et al., 2013), immediately after the intervention session in another five studies and at a separate scheduled time in the remaining studies.

**Independent variable.** A summary of information that relates to the independent variables is provided in Table 3. Researchers targeted personal narrative in three studies, fictional story retells in three studies and original fictional narratives in six studies. The original fictional narratives were based on realistic events in four studies, and on fantastical events in one study.

A wide range of teaching materials and strategies were utilized by researchers and a small range of commonalities was identified. Visual supports were used in all studies and researchers used icons to represent macrostructure components in 10 studies, and pictures or picture books were used in 11 studies. The interventionist modelled an entire narrative in all the studies, macrostructure components were labelled in 11 studies, and participants were provided with an opportunity to produce an entire narrative in nine studies. Published narrative intervention programs were used by researchers in three studies and included The Expression Connection (Klecan-Aker & Brueggeman, 1991), Supporting Knowledge in Language and Literacy (SKILL; Gillam, Gillam, & Laing, 2014) and Story Champs (Spencer & Petersen, 2012).

**Service delivery and intensity.** A summary of information that relates to the service delivery and intensity is provided in Table 4. Intervention was delivered one-to-one by interventionists in ten studies and in small groups of two or three in two studies. The overall mean intervention time was 593 minutes (range 168 minutes – 1485 minutes).

**Research design and quality.** Researchers in eight of the 12 studies utilized a multiple baseline design, three utilized a multiple baseline with probe design and one an ABA design (see Table 1). Eleven studies had potential to demonstrate an intervention effect by showing three demonstrations of experimental control at different times (Horner et al., 2005).

The 12 single case research studies received quality scores using the CEC based quality criteria between 26.8 and 56.8 (mean 49.1) out of a possible 65 (see Supplementary Table 1). Although the overall score for the baseline phase was high at 8.3 out of ten (range 5-10) five studies scored five out of ten as they did not collect five data points in the baseline phase. The social validity scores were low with a mean score of 4 (range 2.5 to 10). The single case research studies were also evaluated for quality using the WWC protocol (see Supplementary Table 2; What Works Clearinghouse, 2017), and four of the studies did not meet evidence

standards. In the remaining studies strong evidence of a causal relationship for macrostructure was found in four studies and for microstructure in one study. Moderate evidence of a causal relationship was found for macrostructure in one study and for microstructure in one study. No evidence of a causal relationship was found in four studies for macrostructure, and in two studies for both microstructure and combined measures.

**Intervention effects.** Researchers judged to show an intervention effect in five of the ten studies with designs robust enough to show experimental effect at three different points in time (Favot et al., 2018a; Gillam et al., 2015; Miller et al., 2018; Petersen et al., 2014; Spencer et al., 2013). Overall PND across all dependent variables was 60% (range 33% - 89%). Overall PND for macrostructure was 77% (range 56% - 100%), for microstructure 43% (range 24% - 80%) and for combined measures was 70% (range 31% - 89%). PND was recalculated with data sets that contained rising baselines and ceiling data points in the baseline phase removed. With those adjustments made, overall PND was 64% (range 30% - 91%), overall PND for macrostructure remained at 77% (range 54%-100%), for microstructure was 41% (range 25% - 80%) and for combined measures was 72% (range 35%-91%).

The overall weighted BC-Tau for the single-case studies was 0.42 (95% CI 0.33, 0.50,  $p<.001$ ) and resolved to a fixed effect analysis ( $Q=10.19$ ,  $df=11$ ,  $p=0.52$ ,  $I^2=0$ ). A forest plot of the results is presented in Figure 1. BC-Tau was positive for all studies and 95% confidence intervals crossed zero for only two studies. Analyses were also conducted separately for macrostructure, microstructure and combined measures. The weighted BC-Tau for macrostructure was 0.45 (95% CI 0.29, 0.58,  $p<.001$ ) and heterogeneity was not significant ( $Q=9.24$ ,  $df=6$ ,  $p=0.16$ ,  $I^2=35.06$ ). The BC-Tau for microstructure was 0.33 (95% CI 0.20, 0.45,  $p<.001$ ) and resolved to a fixed effect analysis ( $Q=4.65$ ,  $df=6$ ,  $p=0.59$ ,  $I^2=0.00$ ). The BC-Tau for combined measures was 0.47 (95% CI 0.34, 0.58,  $p<.001$ ) and



heterogeneity was not significant ( $Q=6.58$ ,  $df=5$ ,  $p=0.25$ ,  $I^2=23.99$ ). Given heterogeneity was not significant for any measure and  $I^2$  was modest, moderator analyses were not conducted.

**Maintenance and generalization.** Researchers reported maintenance data in eight of the 12 studies for 26 of the 33 participants (see Table 4). The time from the end of intervention to maintenance was reported in five studies and was between 1 and 26 weeks. Participants in three studies showed maintenance of the taught skill at or above intervention (Favot et al., 2018a; Favot et al., 2018b; Spencer et al., 2013) and some evidence of maintenance was shown in the remaining studies.

Generalization data were reported by researchers in five studies for eighteen of the nineteen participants (see Table 4). Some evidence of generalization was reported across places by Favot et al. (2018b), across stimulus types by Petersen et al. (production of a narrative in response to a verbal rather than picture stimulus; Petersen et al., 2010) and by Spencer et al. (production of a narrative without supporting pictures; Spencer et al., 2013). Researchers also investigated but found no effect for generalization across people (Favot et al., 2018b) or generalization from being able to retell a purpose written narrative to retelling a published story book typical of classroom use (Favot et al., 2018a).

**Social Validity.** Social validity was evaluated in six of the 12 studies. Measures of narrative quality were included by researchers in three studies and participants' post intervention narratives were rated as being better than their pre intervention narratives by individuals not involved in the research (Favot et al., 2018a; Favot et al., 2018b; Petersen et al., 2010). Participants, teachers and or families were surveyed in three studies to rate the acceptability of the interventions. Researchers concluded that the interventions were appropriate, enjoyable and or important (Finestack et al., 2017; Miller et al., 2018; Spencer et al., 2013).

### **Group Studies**

**Participants.** The 11 group studies included 279 participants in total. Ten studies included 101 females and 136 males. Researchers in two studies did not specify gender. In ten studies the participants ranged in age from 3 years and 2 months to 24 years and four months and participants in the remaining study were described as being in grades 1 and 2.

Where language disorder was clearly specified, participants were described as performing between 1 and 1.5 standard deviations below the mean on standardized language assessments (Fey, Finestack, Gajewski, Popescu, & Lewine, 2010; Justice, Swanson, & Buehler, 2008; Peña et al., 2006; Swanson, Fey, Mills, & Hood, 2005), as being moderately to severely language impaired according to the results of standardized assessments (Hayward & Schneider, 2000) and as being as language impaired (Hettiarachchi, 2016; Petersen et al., 2008; Petersen, Thompsen, Guiberson, & Spencer, 2016).

Participants in one study (Dodd, Ocampo, & Kennedy, 2011) were described as having “educational diagnoses” of autism and one participant in another study was described as having autism. Participants were reported to have a mean performance IQ of 64 according to standardized assessments, 30 participants in another study were reported to have a mild or moderate intellectual disability and the non-verbal IQ of participants in another study were reported to be within normal limits. When clearly described, participants’ existing oral narrative skills were reported to be below average (Justice et al., 2008).

**Dependent Variables.** Combined measures of macrostructure, using a variety of scoring systems and terminology (e.g., “*scenarios, episodes, events*”, “*story information units*”, “*story components*”) were described and coded as dependent variables in five of the 11 studies. Hettiarachchi (2016) did not provide information regarding the constituent parts of her macrostructure “content” score. Combined measures of macrostructure and microstructure were coded in four studies. Results from the TNL (Gillam & Pearson, 2004), were used in one study (Fey et al., 2010) and the Index of Narrative Complexity (INC;

Petersen et al., 2008) in one study (Petersen et al., 2008), the Test of Narrative Retell subtest of the Narrative Language Measures (Petersen & Spencer, 2012) in one study (Petersen et al., 2016) and the narrative quality score (Fey et al., 2004) was used in another (Swanson et al., 2005).

Measures of microstructural complexity and or productivity were coded in nine studies. Other dependent variables were coded in eight studies and included variables such as perspective taking (Dodd et al., 2011) and non-word repetition (Swanson et al., 2005).

**Independent Variables.** The focus of intervention was personal narratives in one study, retells in three, and original fictional narratives in three. The effect of intervention on both narrative retells and original fictional narratives was investigated in four studies.

A range of intervention strategies and materials were used by researchers across the studies. Researchers in eight studies who measured retell and or original fictional narrative used either wordless picture books or pictures during intervention, and researchers in five of those studies also used icons to represent macrostructure elements. Wordless picture books and pictures were used in a further two studies. Clinicians modelled narrative to participants in seven studies, identified macrostructure elements in five studies and provided opportunities to participants to produce an entire narrative in nine studies. Other less commonly used materials and strategies included puppets, graphic organizers, pictography, discussion of the social importance of stories and sentence imitation.

Researchers used published intervention programs in three studies. Bunning et al. (2016) used Storysharing® ([www.openstorytellers.org.uk](http://www.openstorytellers.org.uk)), Petersen et al. (2016) used Story Champs (Spencer & Petersen, 2012) and Hettirarachchi (2016) used Colourful Semantics (Bryan, 1997) but provided limited information about the intervention procedure.

**Service Delivery and Intensity.** Intervention was delivered one-to-one in five of the 11 group studies and in small groups in the remainder. Mean intervention time for each

participant in the nine studies that provided that information was 594 minutes (range 50 to 1440 minutes) and mean session length was 46 minutes (range 20 to 90 minutes) for those same studies.

**Research Quality.** Seven group studies were pretest-posttest single group designs that inherently do not allow confident assertion regarding causal influence (Campbell & Stanley, 1963) and were therefore not evaluated for quality. The mean overall research quality score for the four studies involving comparison group was 6.25 (range 5-8) out of a possible 10 (see Supplementary Table 3). Particular areas of weakness included establishing pretest equivalence and randomization. Of the 11 group studies two included randomized comparison groups and two included nonrandom comparison groups.

Dodd and colleagues (2011) conducted a small randomized comparison group study with 18 participants who each had an educational diagnosis of ASD. Fey et al. (2010) also conducted very small pilot random control group study. Twenty seven participants were randomly assigned to three groups but three participants were specifically placed in the same group as a sibling, effectively compromising the randomization. Data were presented for 23 participants as seven did not complete the treatment program.

A further two studies involved non-randomly constructed comparison groups. Peña et al. (2006) examined the reliability and classification accuracy of a narrative based assessment tool and included an intervention with 14 students with language impairment. Petersen et al. (2016) conducted a study that primarily investigated the generalization or transfer effects of narrative intervention in English to Spanish in 73 bilingual children but included a comparison of a narrative intervention to a non-intervention comparison for children with language impairment. While typically developing children were matched and randomly assigned to treatment and control groups, the 17 of children with language impairments were non-randomly assigned.

**Effectiveness.** Authors of the case studies and single group studies generally reported positive findings. Authors in single group studies reported gains in macrostructure in five studies, in combined macrostructure and microstructure measures in two studies and improvements on measures of microstructure in three studies while authors in one study reported no development in microstructural measures (Bunning et al., 2016).

Four comparison group studies were identified. Dodd et al. (2011) presented a randomized control trial involving participants with ASD that was designed to compare the effects to two different types of narrative intervention, one focused on perspective taking and the second focusing on story elements and semantics. Hedges'  $g$  was calculated on pretest-posttest gain score differences between the groups and standardized by posttest standard deviation. There were moderate positive effect sizes in performance in favor of the intervention that included specific instruction in perspective taking on measures of perspective taking ( $g = 0.71$ ) and number of different mental state terms used ( $g = 0.58$ ). An effect size was not calculated for number of mental state terms as the reported means and standard deviations presented post-intervention did not match the data presented (see Supplementary Table 2, Dodd et al., 2011, p. 29). Dodd et al. (2011) did not provide inferential analysis of their data but two tailed Mann-Whitney  $U$  tests conducted on the difference between pre-post change scores did not reach statistical significance for either perspective taking ( $U = 45.5, n_1 = n_2 = 9, p = 0.66$ ) or number of different mental state terms used ( $U = 54.5, n_1 = n_2 = 9, p = 0.22$ ).

Petersen et al. (2016) compared the performance of children with language impairment who received a narrative intervention program with those who did not. Hedges'  $g$  standardized by posttest standard deviation was not calculable from primary data as only gain score means and standard deviations were presented. Consequently, Hedges'  $g$  was calculated from the Cohen's  $d$  values (Durlak, 2009) provided by the authors. Hedges'  $g$  values in favor

of the treatment group of 1.23 for English causal subordination and 1.14 for English macrostructure were found.

Fey et al. (2010) used variation in a series of additive treatments (narrative intervention followed by Fast ForWord-Language, Fast ForWord-Language followed by narrative intervention, wait list control followed by narrative intervention) across three time points. The most relevant data presented were the initial isolated treatment effects comparing narrative intervention versus Fast ForWord-Language versus wait list control at time. While both the active treatment groups made significant gains over time on the primary dependent variable (NLAI) and the wait list group did not, direct individual comparisons between the groups failed to yield statically significant differences. Between group effect sizes were not calculable from the data presented.

Peña et al. (2006) reported on research which focused primarily on examining the reliability and classification accuracy of a narrative based assessment task. In their second experiment, they compared the responses of children with language impairment receiving a narrative intervention, to typically developing children who received the intervention and a typically developing control group. On measures related to narrative macrostructure, children with language impairment performed similarly to the control group and worse than typically developing children receiving the intervention. Nevertheless, given the groups were deliberately constructed to be different (language impairment versus typically developing), the comparisons did not provide useful information to this review.

## **Discussion**

The purpose of this review was to establish the quality and efficacy of research that investigated the effects of oral narrative intervention on the oral narratives of children with language disorder and to establish the common features of those interventions. The review

included 11 single case research studies, 11 group studies, one study that included both single case and group data, and two case studies.

Three hundred and thirty-four participants aged between 5 years 1 month and 24 years 4 months were involved in the intervention studies included for review. They were described as having varying degrees of language disorder and other cooccurring disabilities. The wide range of ages and degrees of disability suggest that narrative intervention can be applied successfully across a wide range of individuals.

Overall participants in the single case research studies presented with more complex needs than those involved in the group research. Most participants in the single case research were documented to have moderate to severe language disorders and a wider range of additional needs associated with documented disabilities (e.g., ASD, impaired cognitive functioning). While single case research is often a useful approach to research with low incidence conditions, there is case for conducting larger randomized control trial to further validate the findings of existing single case studies. Given the success of single case research that includes participants with documented moderate to severe language disorders and co-occurring disabilities it stands to reason that future research includes control group studies with these populations.

Macrostructure has been called fundamental to narrative (Sperry & Sperry, 1996) and was measured as a primary or secondary dependent variable, either in isolation or as part of a combined measure with microstructure in all but one study (Dodd et al., 2011). The macrostructure elements measured in the studies incorporated, using different terminologies and levels of complexity the who, what, where and feelings of an event. Macrostructure rubrics are a measure of the quantity of information provided in a narrative (Hayward & Schneider, 2000) and provide a flexible framework which individuals can use to learn and practice narrative skills (Hayward, Gillam, & Lien, 2007). Discreet measures of

microstructural productivity and or complexity were included in 18 studies and were captured as part of a combined measure in a further two studies included for review. Researchers in five studies collected data immediately after intervention. Participants' performance after intervention may not reflect performance at other times and ideally data should be collected before intervention occurs (Alberto & Troutman, 2009).

Only four of the studies included reports on the effect of intervention on personal narratives, with the remainder addressing the effect of intervention on either original fictional narrative, fictional narrative retells or both. Spencer (2009) suggested that researchers may focus on the development of fictional rather than personal narrative in intervention as fictional narratives are easier to elicit from the participants. In addition, with fictional narratives the clinician is able to create the narratives and supporting materials and is able to confirm the correspondence of the narrative with the stimulus materials (Spencer, 2009). However, strategies have been developed in some research to create materials to support narrative and verify accuracy. Favot (2018b) for example used photographs of recent events supplied by families to elicit personal narratives and assist in verifying accuracy. Personal narrative has been identified as an important intervention target (Johnston, 2008; Hewitt, 2019). Researchers have classified up to 70% of the narrative talk of young children as personal narrative (Preece, 1987) and individuals who have skills in generating personal narrative may be able to use those skills to engage in positive social interactions (Johnston, 2008). Thus, further research with individuals to develop personal narrative skills can be considered a priority.

Commonly used teaching strategies included the clinician modelling narrative, labelling the macrostructure components and the participant being given an opportunity to say an entire narrative during intervention. Researchers in two studies (Hayward & Schneider, 2000; Klecan-Aker & Gill, 2005) did not provide participants with the opportunity to tell an entire



narrative within intervention and intervention effects in those studies were not clear cut. It could be possible that the regular telling of complete narratives within the intervention is central to individuals developing narrative generation skills and should therefore be a component of intervention programs.

Icon cards to represent macrostructure elements and or pictures to support the telling of the target narrative were used by researchers in all but one study. The use of visual supports may help alleviate the cognitive demands on individuals with language disorder and co-occurring disabilities (Finestack, 2012) by providing a tangible structural scaffold for the target narrative and should also be a component of intervention.

Researchers in ten of the 12 single case research studies and in five of the 11 group studies delivered intervention in a one-to-one setting. This is resource intensive and may not be practical, particularly in educational settings. Thus, there is a case for future research examining strategies and materials that are known to work in one-to-one settings with small and large groups. Building efficacy for group interventions is vital for school-based speech pathologists who deliver the majority of their services to students in a group setting (Brandel & Frome Loeb, 2011) as well as for other staff who may be delivering programs.

The overall mean quality for the single case research studies according to the CEC based quality criteria was 49 out of a possible 65 (range of 26.9 to 56.8) suggesting that the results can be interpreted with a degree of confidence. Despite the overall quality of the single case research included for review two areas of particular weakness were noted, social validity and baseline data. Social validity is an important component of single case research (Carr, Austin, Britton, Kellum, & Bailey, 1999) as it measures the acceptability and practicality (Carter, 2010) of intervention as well as its meaningful impact (Foster & Mash, 1999). Researchers in three studies measured participant performance and asked independent observers to rate narrative sample quality. Performance based measures of social validity can

be used to establish the social impact of intervention (Carter, 2010) and should be considered by researchers in future studies. Second, in several studies inadequate baseline data were presented. Insufficient baseline data were collected to establish baseline trends or intervention started before baseline data were stable. Single case study researchers should pay particular attention to CEC and WWC guidelines and collect a minimum of five baseline data points. Horner et al. (2005) states that measurement of the dependent variable should continue in the baseline phase until it is stable and predictable and that typically requires five or more data points.

According to the WWC quality criteria four of the 12 studies did not meet evidence standards. The four single case research studies that did not meet evidence standards as they did not include at least three attempts to demonstrate an intervention effect over three different points in time. It is important for researchers in future studies to carefully consider appropriate research designs and ensure that they include provision for at least three attempts to demonstrate control.

The group research studies were generally of low quality. Four comparison group studies were included and of those studies only two included random group assignment. In one study with random assignment the authors did not state the method used to allocate participants to groups (Dodd et al., 2011) and randomization was compromised in the other (Fey et al., 2010). In addition, these studies were very small, limiting interpretation. Failure to establish pretest equivalence was another area of weakness. This is important when dealing with very small studies when there is increased risk that randomization will not yield equivalent groups. A number of the studies met the inclusion criteria and provided some relevant data regarding narrative intervention outcomes, but their primary focus was not evaluating narrative interventions (Fey et al., 2010; Petersen et al., 2008; Peña et al., 2006). Where relevant comparisons were possible, effect sizes were in the moderate to large range,

but this should be interpreted cautiously given the very small sample sizes and methodological limitations identified. The seven pretest posttest studies were positive and useful in providing preliminary evidence of interventions but are uninterpretable with regard to causal influence. While these studies are useful in establishing an initial proof of concept and to pilot measurement and interventions, follow-up studies using more rigorous designs are needed to establish causation.

Thus, existing group studies do not allow confident conclusions regarding the effectiveness of narrative intervention for children with language disorders. Larger and more robustly designed studies need to be conducted. Nevertheless, it should be acknowledged that group studies with populations who have additional learning needs can be problematic as it can be difficult to recruit participants in sufficient numbers.

The single case research studies included in this review generally reported positive findings for combined macrostructure and microstructure measures and for measures of macrostructure but not so for measures of microstructure. Macrostructure was moderately effective for both BC-Tau and PND, microstructure and combined measures were both moderate for BC-Tau and mild for PND. Researchers have noted that children with language disorder may not be able to concurrently improve skills in both narrative macrostructure and microstructure (Colozzo, Morris, & Mirenda, 2015) because as children begin to produce language that is more conceptually advanced there may be microstructural tradeoffs (Justice et al., 2006).

Researchers in nine single case research studies and in one group study reported maintenance data for at least some of their participants. Maintenance is a measure of social function as it illustrates that the skills taught in intervention are being reinforced after the intervention has stopped (Carter, 2010). Baer, Wolf, and Risley (1987) go further to suggest that changes in participants' behaviors that do not maintain over time cannot be considered

effective. Researchers who reported maintenance data reported at least some evidence of maintenance of the taught skills. Future research should include maintenance measures.

Narratives of all classes are used in daily discourse and researchers and clinicians should aim to ensure that learned skills can generalize from learning environments to a wide variety of natural environments, communication partners and behaviors (Baer, Wolf, & Risley, 1968; Bliss & McCabe, 2012). Generalization data was collected in only five single case research studies and one group study included for review and results were mixed. Given the restricted evidence of generalization in the studies examined, future researchers should give consideration to both systematically monitoring generalization and embedding techniques to facilitate generalization in interventions.

### **Conclusion**

Interventions to investigate the efficacy of oral narrative interventions in children with language disorder is a growing area. On balance, based on this review it appears that oral narrative intervention with children with language disorder is likely to be effective although further research is needed. Icons, visuals, labelling of macrostructural elements, participants generating narratives and clinician modelling may be effective materials and strategies for clinicians when teaching oral narratives to children with language disorders. The single case research studies were generally of good quality meaning that the results can be interpreted with confidence. The group studies however were generally of low quality. Areas for future research include conducting robust group research interventions, investigating the effect of intervention on children with more significant difficulties, delivering intervention in group settings, collecting a range of generalization measures, and conducting additional research on the effect of intervention on personal narrative skills.

**Funding:** No grants or any other financial support was received for this paper.

## References

- Alberto, P. A., & Troutman, A. C. (2009). *Applied behavior analysis for teachers* (8th ed.). Upper Saddle River, NJ: Pearson.
- Allen, M. S., Kertoy, M. K., Sherblom, J. C., & Pettit, J. M. (1994). Children's narrative productions: A comparison of personal event and fictional stories. *Applied Psycholinguistics*, 15, 149-176. doi:10.1017/S0142716400005300
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed, text rev ed.). Washington DC, VA: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Arizona Software Inc. (2012). Graphclick (Version 3.0.3) [Computer software]. Retrieved from <https://graphclick.en.softonic.com/mac>
- Australian Curriculum, Assessment and Reporting Authority [ACARA]. (2016). Australian Curriculum: English. Retrieved from <https://www.australiancurriculum.edu.au/f-10-curriculum/english/?layout=1#cdcode=ACELA1428&level=F>
- Baer, D. M., & Wolf, M. M. (1987). Some still current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 20, 313-327.
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1, 91-97.
- Baixauli, I., Colomer, C., Roselló, B., & Miranda, A. (2016). Narratives of children with high-functioning autism spectrum disorder: A meta-analysis. *Research in Developmental Disabilities*, 59, 234-254. doi:10.1016/j.ridd.2016.09.007
- Bliss, L. S., & McCabe, A. (2008). Personal narratives: Cultural differences and clinical implications. *Topics in Language Disorders*, 28, 162-177.  
doi:10.1097/01.TLD.0000318936.31677.2d

- Bliss, L. S., & McCabe, A. (2012). Personal narratives: Assessment and intervention. *Perspectives on Language Learning and Education*, 19, 130-138.  
doi:10.1044/lle19.4.130
- Bloome, D., Katz, L., & Champion, T. (2003). Young children's narratives and ideologies of language in classrooms. *Reading & Writing Quarterly*, 19, 205-223.  
doi:10.1080/10573560308216
- Borenstein, M., Hedges, L., Higgins, J., & Rothstein, H. R. (2005). *Comprehensive meta-analysis (Version 2) [Computer software]*. Englewood, NJ: Biostat.
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. Chichester, UK: John Wiley.
- Botting, N. (2002). Narrative as a tool for the assessment of linguistic and pragmatic impairments. *Child Language Teaching and Therapy*, 18, 1-21.  
doi:10.1191/0265659002ct224oa
- Brandel, J., & Frome Loeb, D. (2011). Program intensity and service delivery models in the schools: SLP survey results. *Language, Speech, and Hearing Services in Schools*, 42, 461-490. doi:10.1044/0161-1461(2011/10-0019)
- Brewer, W. F., & Lichtenstein, E. H. (1980). *Event schemas, story schemas, and story grammars* (Report No. 197). Champaign, IL: Center for the Study of Reading.
- Brossart, D. F., Laird, V. C., & Armstrong, T. W. (2018). Interpreting Kendall's Tau and Tau-U for single-case experimental designs. *Cogent Psychology*, 5.  
doi:10.1080/23311908.2018.1518687
- Brown, R. (1973). *A first language: The early stages*. Cambridge, MA: Harvard University Press.

- Bryan, A. (1997). Colourful semantics: Thematic role therapy. In S. Chiat, J. Law, & J. Marshall (Eds.), *Language disorders in children and adults: Psycholinguistic approaches to therapy* (pp. 143-161). London, UK: Whurr Publishers.
- Bunning, K., Gooch, L., & Johnson, M. (2016). Developing the personal narratives of children with complex communication needs associated with intellectual disabilities: What is the potential of Storysharing(®). *Journal of Applied Research in Intellectual Disability*, 30, 743-756. doi:10.1111/jar.12268
- Caldwell, D., & White, P. R. R. (2017). That's not a narrative; this is a narrative: NAPLAN and pedagogies of storytelling. *Australian Journal of Language and Literacy*, 40, 16-27.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago, IL: Rand McNally.
- Carr, J. E., Austin, J. L., Britton, L. N., Kellum, K. K., & Bailey, J. S. (1999). An assessment of social validity trends in applied behavior analysis. *Behavioral Interventions*, 14, 223-231.
- Carter, M. (2013). Reconsidering overlap-based measures for quantitative synthesis of single-subject data: What they tell us and what they don't. *Behavior Modification*, 37, 378-390. doi:10.1177/0145445513476609
- Carter, S. (2010). *The social validity manual: A guide to subjective evaluation of behavior interventions*. Amsterdam, The Netherlands: Academic Press.
- Cheshire, J. (2000). The telling or the tale? Narratives and gender in adolescent friendship networks. *Journal of Sociolinguistics*, 4, 234-262. doi:10.1111/1467-9481.00113
- Colozzo, P., Gillam, R. B., Wood, M., Schnell, R. D., & Johnston, J. R. (2011). Content and form in the narratives of children with specific language impairment. *Journal of Speech*

*Language and Hearing Research*, 54, 1609-1627. doi:10.1044/1092-4388(2011/10-0247

Colozzo, P., Morris, H., & Mirenda, P. (2015). Narrative production in children with autism spectrum disorder and specific language impairment. *Canadian Journal of Speech Language Pathology and Audiology*, 39, 316-332.

Cowley, J., & Glasgow, C. (1994). *The Renfrew Bus Story: Language screening by narrative recall*. Circle Pines, MN: American Guidance.

Department of Education. (2014). National curriculum in England: English programmes of study. Retrieved from <https://www.gov.uk/government/publications/national-curriculum-in-england-english-programmes-of-study/national-curriculum-in-england-english-programmes-of-study>

Dodd, J. L., Ocampo, A., & Kennedy, K. S. (2011). Perspective taking through narratives. *Communication Disorders Quarterly*, 33, 23-33. doi:10.1177/1525740110395014

Durlak, J. A. (2009). How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology*, 34, 917-928. doi:10.1093/jpepsy/jsp004

Engel, S. (1995). *The stories children tell: Making sense of the narratives of childhood*. New York, N.Y: W.H. Freeman.

Estigarribia, B., Martin, G. E., Roberts, J. E., Spencer, A., Gucwa, A., & Sideris, J. (2011). Narrative skill in boys with fragile X syndrome with and without autism spectrum disorder. *Applied Psycholinguistics*, 32, 359-388. doi:10.1017/S0142716410000445

Favot, K., Carter, M., & Stephenson, J. (2018a). The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study. *Journal of Developmental and Physical Disabilities*, 30, 615-637. doi:10.1007/s10882-018-9608-y



- Favot, K., Carter, M., & Stephenson, J. (2018b). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language impairment: A pilot study. *International Journal of Disability, Development and Education*, 492-509. Retrieved from <http://dx.doi.org/10.1080/1034912x.2018.1453049>
- Fey, M., Finestack, L. H., Gajewski, B. J., Popescu, M., & Lewine, J. D. (2010). A preliminary evaluation of Fast Forward-Language as an adjuvant treatment in language intervention. *Journal of Speech Language and Hearing Research*, 53, 430-449.
- Fey, M. E., Catts, H. W., Proctor-Williams, K., Tomblin, J. B., & Zhang, X. (2004). Oral and written story composition skills of children with language impairment. *Journal of Speech, Language, and Hearing Research*, 47, 1301-1318. doi:10.1044/1092-4388(2004/098)
- Finestack, L., O'Brien, K. H., Hyppa-Martin, J., & Lyrek, K. A. (2017). The evaluation of a personal narrative language intervention for school-Age children with Down syndrome. *American Journal on Intellectual and Developmental Disabilities*, 122, 310-332. doi:10.1352/1944-7558-122.4.310
- Finestack, L. H. (2012). Five principles to consider when providing narrative language intervention to children and adolescents with developmental disabilities. *Perspectives on Language Learning and Education*, 19, 147-154. doi:10.1044/11e19.4.147
- Foster, S. L., & Mash, E. J. (1999). Assessing social validity in clinical treatment research: Issues and procedures. *Journal of Consulting and Clinical Psychology*, 67, 308-319. doi:10.1037/0022-006X.67.3.308
- Gillam, R., & Pearson, N. A. (2004). *Test of Narrative Language [Assessment Instrument]*. Austin, TX: Pro-Ed.
- Gillam, R. B., & Pearson, N. A. (2017). *Test of Narrative Language: Second Edition (TNL-2) [Assessment Instrument]*. Austin, TX: Pro- ed.

- Gillam, S. L., & Gillam, R. B. (2016). Narrative discourse intervention for school-aged children with language impairment: Supporting knowledge in language and literacy. *Topics in Language Disorders*, 36, 20-34. doi:10.1097/TLD.0000000000000081
- Gillam, S. L., Gillam, R. B., Fargo, J. D., Olszewski, A., & Segura, H. (2017). Monitoring indicators of scholarly language: A progress-monitoring instrument for measuring narrative discourse skills. *Communication Disorders Quarterly*, 38, 96-106. doi:10.1177/1525740116651442
- Gillam, S. L., Gillam, R. B., & Laing, C. E. (2014). *Supporting knowledge in language and literacy*. Logan, Utah: Utah State University.
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech Language and Hearing Research*, 58, 920-933. doi:10.1044/2015\_JSLHR-L-14-0295
- Gillam, S. L., Olszewski, A., Squires, K., Wolfe, K., Slocum, T., & Gillam, R. B. (2018). Improving narrative production in children with language disorders: An early-stage efficacy study of a narrative intervention program. *Language Speech and Hearing Services in Schools*, 49, 197-212. doi:10.1044/2017\_LSHSS-17-0047
- Hayward, D., & Schneider, P. (2000). Effectiveness of teaching story grammar knowledge to pre-school children with language impairment. An exploratory study. *Child Language Teaching and Therapy*, 16, 255-284. doi:10.1191/026565900680410215
- Hayward, D. V., Gillam, R. B., & Lien, P. (2007). Retelling a script-based story: Do children with and without language impairments focus on script and story elements? *American Journal of Speech-Language Pathology*, 16, 235-245. doi:10.1044/1058-0360(2007/028)
- Hedberg, N. L., & Westby, C. E. (1993). *Analyzing storytelling skills: Theory to practice*. Tuscon, AZ: The Psychological Corporation.

- Hettiarachchi, S. (2016). The effectiveness of Colourful Semantics on narrative skills in children with intellectual disabilities in Sri Lanka. *Journal of Intellectual Disability*, 20, 18-33. doi:10.1177/1744629515591410
- Hewitt, L. E. (2019). Narrative as a critical context for advanced language development in autism spectrum disorder. *Perspectives of the ASHA Special Interest Groups*, 4, 430-437. doi:10.1044/2019\_pers-sig1-2018-0021
- Hickman, M. (2003). *Children's discourse: Person, space and time across language* (98). London, England: Cambridge University Press.
- Higgins, J. P. T., & Green, S. (Eds.). (2011). *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]*. The Cochrane Collaboration. [www.handbook.cochrane.org](http://www.handbook.cochrane.org).
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71, 165-179. doi:10.1177/001440290507100203
- Hughes, D. L., McGillivray, L., & Schmidek, M. (1997). *Guide to narrative language: Procedures for assessment*. Eau Claire, WI: Thinking Publications.
- Johnston, J. R. (2008). Narratives: Twenty-five years later. *Topics in Language Disorders*, 28, 93-98. doi:10.1097/01.TLD.0000318931.08807.01
- Justice, E. C., Swanson, L. A., & Buehler, V. (2008). Use of narrative - based language intervention with children who have cochlear implants. *Topics in Language Disorders*, 28, 149-161. doi:10.1097/01.TLD.0000318935.54548.36
- Justice, L. M., Bowles, R. P., Kaderavek, J. N., Ukrainetz, T. A., Eisenberg, S. L., & Gillam, R. B. (2006). The index of narrative microstructure: A clinical tool for analyzing school-age children's narrative performances. *American Journal of Speech-Language Pathology*, 15, 177-191. doi:10.1044/1058-0360(2006/017)

- Kaderavek, J. (2015). *Language disorders in children: Fundamental concepts of assessment and intervention* (2nd ed.). Boston, MA: Pearson.
- Kalmbach, J. R. (1986). Evaluating informal methods for the assessment of retellings. *Journal of Reading*, 30, 119-127. Retrieved from <http://www.jstor.org/stable/40017374>
- Klecan-Aker, J. S., & Brueggeman, L. (1991). *The expression connection*. Vero Beach, Fla: The Speech Bin.
- Klecan-Aker, J. S. (1993). A treatment programme for improving story-telling ability: A case study. *Child Language Teaching and Therapy*, 9, 105-115.
- Klecan-Aker, J. S., & Gill, C. (2005). Teaching language organization to a child with pervasive developmental disorder: A case study. *Child Language Teaching and Therapy*, 21, 60-74. doi:10.1191/0265659005ct281oa
- Leong, H. M., Carter, M., & Stephenson, J. R. (2015). Meta-analysis of research on sensory integration therapy for individuals with developmental and learning disabilities. *Journal of Developmental and Physical Disabilities*, 27, 183-206. doi:10.1007/s10882-014-9408-y
- Marini, A., Martelli, S., Gagliardi, C., Fabbro, F., & Borgatti, R. (2010). Narrative language in Williams syndrome and its neuropsychological correlates. *Journal of Neurolinguistics*, 23, 97-111. doi:10.1016/j.jneuroling.2009.10.002
- Mastropieri, M. S., Scruggs, T. E., Bakken, J. P., & Whedon, C. (1996). Reading comprehension: A synthesis of research in learning disabilities. In T. E. Scruggs & M. S. Mastropieri (Eds.), *Advances in learning and behavioral disabilities (Volume 10b)* (pp. 201-227). New York, NY: Elsevier Science/ JAI Press.
- McCabe, A., & Bliss, L. S. (2005). Narratives from Spanish-speaking children with impaired and typical language development. *Imagination, Cognition and Personality*, 24, 331-346. doi:10.2190/CJQ8-8C9G-05LG-0C2M

- McCabe, A., & Rollins, P. R. (1994). Assessment of preschool narrative skills. *American Journal of Speech-Language Pathology*. doi:10.1044/1058-0360.0301.45
- Miller, R. D., Correa, V. I., & Katsiyannis, A. (2018). Effects of a story grammar intervention with repeated retells for English learners with language impairments. *Communication Disorders Quarterly*, 40, 15-27. doi:10.1177/1525740117751897
- Morrow, L. M. (1985). Retelling stories: A strategy for improving young children's comprehension, concept of story structure, and oral language complexity. *The Elementary School Journal*, 85, 647-661. doi:10.1086/461427
- National Governors Association Center for Best Practices and Council of Chief State School Officers. (2010). *Common core standards*. Retrieved from <http://www.corestandards.org>
- Owens, R. E., Jr. (2016). *Language development: An introduction* (9th ed.). Upper Saddle River, NJ: Pearson.
- Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect size in single-case research: A review of nine nonoverlap techniques. *Behaviour Modification*, 35, 303-322. doi:10.1177/0145445511399147
- Parker, R. I., Vannest, K. J., Davis, J. L., & Sauber, S. B. (2011). Combining nonoverlap and trend for single-case research: Tau-U. *Behavior Therapy*, 42, 284-299. doi:10.1016/j.beth.2010.08.006
- Peña, E. D., Gillam, R. B., Malek, M., Ruiz-Felter, R., Resendiz, M., Fiestas, C., & Sabel, T. (2006). Dynamic assessment of school-age children's narrative ability: An experimental investigation of classification accuracy. *Journal of Speech, Language, and Hearing Research*, 49, 1037-1057. Retrieved from <http://jslhr.pubs.asha.org/article.aspx?articleid=1767638&resultclick=1>

- Petersen, D. B., Gillam, S. L., & Gillam, R. B. (2008). Emerging procedures in narrative assessment: The index of narrative complexity. *Topics in Language Disorders*, 28, 115-130. doi:10.1097/01.TLD.0000318933.46925.86
- Petersen, D. B. (2011). A systematic review of narrative-based language intervention with children who have language impairment. *Communication Disorders Quarterly*, 32, 207-220. doi:10.1177/1525740109353937
- Petersen, D. B., Brown, C. L., Ukrainetz, T. A., Wise, C., Spencer, T. D., & Zebre, J. (2014). Systematic individualized narrative language intervention on the personal narratives of children with autism. *Language, Speech, and Hearing Services in Schools*, 45, 67-86. doi:10.1044/2013\_LSHSS-12-0099
- Petersen, D. B., Gillam, S. L., Spencer, T., & Gillam, R. B. (2010). The effects of literate narrative intervention on children with neurologically based language impairments: An early stage study. *Journal of Speech, Language, and Hearing Research*, 53, 961-981. doi:10.1044/1092-4388(2009/09-0001)
- Petersen, D. B., & Spencer, T. D. (2012). The narrative language measures: Tools for language screening, progress monitoring, and intervention planning. *Perspectives on Language Learning and Education*, 19, 119-129.
- Petersen, D. B., Thompson, B., Guiberson, M. M., & Spencer, T. D. (2016). Cross-linguistic interactions from second language to first language as the result of individualized narrative language intervention with children with and without language impairment. *Applied Psycholinguistics*, 37, 703-724. doi:10.1017/s0142716415000211
- Peterson, C., & McCabe, A. (1991). Linking children's connective use and narrative macrostructure. In C. Peterson & A. McCabe (Eds.), *Developing narrative structure* (pp. 29-54). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc. Retrieved from <http://psycnet.apa.org/psycinfo/1991-97747-001>

- Polanyi, L. (1985). *Telling the American story*. Norwood, NJ: Ablex.
- Preece, A. (1987). The range of narrative forms conversationally produced by young children. *Journal of Child Language*, 14, 353-373. doi:10.1017/S0305000900012976
- Preston, D., & Carter, M. (2009). A review of the efficacy of the picture exchange communication system intervention. *Journal of Autism and Developmental Disorders*, 39, 1471-1186. doi:10.1007/s10803-009-0763-y
- Reynhout, G., & Carter, M. (2011). Evaluation of the efficacy of Social Stories™ using three single subject metrics. *Research in Autism Spectrum Disorders*, 5, 885-900. doi:10.1016/j.rasd.2010.10.003
- Scruggs, T. E., & Mastropieri, M. A. (1998). Summarizing single-subject research issues and applications. *Behavior Modification*, 22, 221-242. doi:10.1177/01454455980223001
- Segal, A., & Pesco, D. (2015). Narrative skills of youth with Down syndrome: A comprehensive literature review. *Journal of Developmental and Physical Disabilities*. doi:10.1007/s10882-015-9441-5
- Shelton, J. O. (1999). A case study: The effects of teaching story grammar through visual symbols to two students with language and learning disabilities. *Contemporary Issues in Communication Sciences and Disorders*, 26, 23-34.
- Shiro, M. (2003). Genre and evaluation in narrative development. *Journal of Child Language*, 30, 165-195. doi:10.1017/S0305000902005500
- Soto, G., Yu, B., & Kelso, J. (2008). Effectiveness of multifaceted narrative intervention on the stories told by a 12-year-old girl who uses AAC. *Augmentative and Alternative Communication*, 24, 76-87. doi:10.1080/07434610701740612
- Spencer, T. D. (2009). *The effect of a narrative intervention on preschoolers' story retelling and personal story generation skills*. (Unpublished doctoral dissertation). Retrieved from Proquest Dissertations and Theses, Utah State University. (3372989).

- Spencer, T. D., Kajian, M., Petersen, D. B., & Bilyk, N. (2013). Effects of an individualized narrative intervention on children's storytelling and comprehension skills. *Journal of Early Intervention, 35*, 243-269. doi:10.1177/1053815114540002
- Spencer, T. D., & Petersen, D. B. (2012). *Story Champs: A multi-tiered language intervention program*. Laramie, WY: Language Dynamics Group. Retrieved from <http://www.languagedynamicsgroup.com>
- Spencer, T. D., & Petersen, D. B. (2018). Bridging oral and written language: An oral narrative language intervention study with writing outcomes. *Language Speech and Hearing Services in Schools, in press*, 1. doi:10.1044/2018\_lshss-17-0030
- Sperry, L. L., & Sperry, D. E. (1996). Early development of narrative skills. *Cognitive Development, 11*, 443-465. doi:10.1016/S0885-2014(96)90013-1
- Stein, N. L., & Glenn, C. G. (1978). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), *New directions in discourse processing* (pp. 53 - 120). Norwood, NJ: Ablex Publishing Corporation.
- Swanson, L. A., Fey, M. E., Mills, C. E., & Hood, L. S. (2005). Use of narrative-based language intervention with children who have specific language impairment. *American Journal of Speech-Language Pathology, 14*, 131-141. doi:10.1044/1058-0360(2005/014)
- Tarlow, K. R. (2017). An improved rank correlation effect size statistic for single-case designs: Baseline corrected Tau. *Behavior Modification, 41*, 427-467. doi:10.1177/0145445516676750
- Tarlow, K. R. (2016). *Baseline corrected tau calculator*. Retrieved from <http://ktarlow.com/stats/tau/>
- Vannest, K. J., & Ninci, J. (2015). Evaluating intervention effects in single-case research designs. *Journal of Counseling & Development, 93*, 403-411. doi:10.1002/jcad.12038



Westby, C. (1991). Learning to talk, talking to learn: Oral literate language differences. In C. S. Simon (Ed.), *Communication skills and classroom success* (pp. 334-357). Eau Claire, WI : Thinking Publications.

What Works Clearinghouse. (2017). Standards Handbook Version 4.0. Retrieved from <https://ies.ed.gov/ncee/wwc/Handbooks#procedures>

Table 1

*Summary of Research Design and Participants*

Study	AB	ABA	Multiple baseline with probe	Random control trial (RCT)	Comparison group (non random)	Single group / pre – post	Case study	Number	Age (years: months)		Gender		Diagnosis						
									Range (Y:M)	Mean	Female	Male	ASD	LD	DD	ID	IQ	Other	
Single case research studies																			
Favot et al. (2018a)			✓					4	6:6-9:2	7:6	2	2	✓	✓				2 verbal IQ below 1 <sup>st</sup> Percentile, 1 verbal IQ mild disability	
Favot et al. (2018b)			✓					3	5:1-6:7	5:8	1	2	✓	✓				1 verbal IQ mild disability	
Finestack et al. (2017)			✓					4	10:1-15:4	11:11	4			✓				Down syndrome	
Gillam et al. (2015)			✓					5	8:4-10:9	9:9	2	3	✓	✓					
Gillam et al. (2018)			✓					6	6:7-10:4	7:10	2	4		✓					
Hayward & Schneider (2000)			✓					13	4:8-6:4	5:2	5	8	✓	✓				ADD, ADHD, CP	
Klecan-Aker & Gill (2005)		✓						1	7:8	7:8		1	✓						
Miller et al. (2018)			✓					4	9:4-10:1	9:8	2	2		✓				Learning disability, limited English	
Petersen et al. (2014)			✓					3	6:4-8:5	7:1		3	✓	✓					
Petersen et al. (2010)			✓					3	6:3-8:1	6:11	2	1		✓			1 slightly below non-verbal IQ	CP, spina bifida	
Shelton (1999)			✓					2	9:2-10:2	9:8	1	1		✓				Learning disability, ADHD	
Spencer et al. (2013)			✓					5	4:8-4:11	4:9	4	1		✓	✓				
Group Studies																			
Bunning et al. (2017)						✓		11	12:03-16:02		4	7		✓					

Diez-Itza et al. (2018)		✓	8	8:11-24:04	16:08	4	4		✓	✓	Performance IQ mean 64 (44-90)	
Dodd et al. (2011)	✓		18	9:07-12:02	10:08	7	11	✓				
Fey et al. (2010)	✓		30	6:00-8:00	7:05				✓		Non-verbal IQ above 70	
Hayward & Schneider (2000)		✓	13	4:08-6:04	5:02	5	8					
Hettiarachchi (2016)		✓	30	3:02-15:00	8:03	8	22	✓	✓	✓	✓	CP, ADHD, Down Syndrome
Justice et al. (2008)		✓	3	5:04-8:00	6:11	3			✓			
Pena et al. (2006)	✓		71			32	39		✓			
Petersen et al. (2008)		✓	12	6:04-9:01	8:02				✓			
Petersen et al. (2016)	✓		73	5:11-9:08					✓			
Swanson et al. (2005)		✓	10	6:11-8:09	7:10	2	8		✓			
Other												
Gillam & Gillam (2016)		✓	1	10	10		1	✓	✓			
Klecan-Aker (1993)		✓	1	8:08	8:08		1					Language learning disabled

Table 2

*Summary of Dependent Variables*

Dependent variable				Scope of narrative and stimulus for dependent variable																					
Study	Macrostructure	Combined measure				Mico-structure	Other	Personal	Personal narrative stimulus materials			Retell	Narrative retell stimulus materials			Original fiction	Original fiction (realistic)	Original fiction (fantasy)	Original fictional narrative stimulus materials						
		INC	MISL	TNR	Other				Single picture	verbal	Model story		other	Purpose written story (no pics)	Purpose written story (pics)				Published story book	Other	Picture of initiating event	Picture of setting	Picture sequence	Verbal story idea or sentence starter	Model story
Single case research																									
Favot et al. (2018a)	✓										✓		✓												
Favot et al. (2018b)	✓							✓	✓	✓		✓													
Finestack et al. (2017)	✓	✓			✓		✓		✓																
Gillam et al. (2015)	✓		✓		✓		✓								✓	✓				✓					
Gillam et al. (2018)			✓				✓								✓	✓			✓						
Hayward & Schneider (2000)	✓							✓							✓			✓			✓				
Klecan-Aker & Gill (2005)	✓						✓								✓								SPARC, magazine pictures		
Miller et al. (2018)					✓		✓				✓				✓										
Petersen et al. (2014)	✓						✓			✓	✓														

Petersen et al. (2010)	✓			✓						✓	✓			✓
Shelton (1999)	✓			✓						✓	✓		✓	
Spencer et al. (2013)			✓	✓				✓	✓	✓				
Group Studies														
Bunning et al. (2017)	✓			✓	✓	✓		✓	✓					
Diez-Itza et al. (2018)	✓			✓	✓			✓			✓			
Dodd et al. (2011)				✓	✓			✓			✓			
Fey et al. (2010)			✓	✓	✓			✓		✓		✓		✓
Hayward & Schneider (2000)	✓				✓					✓		✓		✓
Hettiarachchi (2016)	✓			✓				✓		✓				✓
Justice et al. (2008)				✓	✓			✓			✓	✓		✓
Pena et al. (2006)	✓			✓	✓					✓				✓
Petersen et al. (2008)		✓		✓		✓		✓		✓		✓	✓	✓
Petersen et al. (2016)			✓	✓				✓	✓					
Swanson et al. (2005)			✓	✓	✓					✓			✓	✓
Other														
Gillam & Gillam (2016)		✓			✓			✓	✓		✓		✓	
Klecan-Aker (1993)	✓			✓						✓				✓

Table 3

*Summary of Independent Variable – Materials and Strategies*

Study	Materials					Strategies		
	Published program	Icons	Picture books	Pictures	Other	Model narrative	Labelling macrostructure elements	Opportunity to produce whole narrative
Single case research								
Favot et al. (2018a)		✓			Oral stories	✓	✓	✓
Favot et al. (2018b)		✓		✓		✓	✓	✓
Finestack et al. (2017)				✓	iPod touch, daily log app, narrative map	✓		✓
Gillam et al. (2015)		✓	✓		Storyboards, graphic organiser, iPads	✓	✓	✓
Gillam et al. (2018)	✓	✓	✓		Storyboards, graphic organiser	✓	✓	✓
Hayward & Schneider (2000)		✓	✓		Story props	✓	✓	
Klecan-Aker & Gill (2005)	✓		✓			✓	✓	
Miller et al. (2018)		✓	✓		Story grammar marker, post it notes	✓	✓	✓
Petersen et al. (2014)		✓		✓		✓	✓	✓
Petersen et al. (2010)		✓	✓	✓	Recorded stories	✓	✓	✓
Shelton (1999)		✓		✓		✓	✓	
Spencer et al. (2013)	✓	✓		✓		✓	✓	✓
Group Studies								
Bunning et al. (2017)	✓				Props, voice output systems, gestures	✓		
Diez-Itza et al. (2018)				✓		✓		✓

Dodd et al. (2011)	✓	✓		Story grammar marker, puppets, perspective taking map, beginning middle end worksheet	✓	✓	✓	Open ended and inferential questions, student's drawing characters' emotions, sequence statements
Fey et al. (2010)			✓	18 stories developed for program	✓		✓	Sentence imitation, co creation of story, pictography, questions
Hayward & Schneider (2000)	✓		✓		✓	✓		Sorting and sequencing story components, role play with props, identify missing components, comprehension, vocabulary instruction
Hettiarachchi (2016)	✓	✓	✓				✓	Makaton signs for "wh" words, games, word webs,
Justice et al. (2008)	✓		✓	Story grammar marker, parent copy of created story	✓	✓	✓	Clinician draw matching illustrations and write text, auditory bombardment, sentence imitation, questions
Pena et al. (2006)			✓	Puppets		✓	✓	Discuss social importance of stories and order of elements, model parts of narrative
Petersen et al. (2008)			✓	Graphic organizers			✓	Instruction in microstructure and dialogue
Petersen et al. (2016)	✓	✓	✓		✓		✓	
Swanson et al. (2005)			✓	Purpose written stories	✓	✓	✓	Sentence imitation, recast and model target structures
Other								
Gillam & Gillam (2016)	✓	✓	✓	✓	✓	✓	✓	Comprehension, vocabulary development, pictography, parallel story development
Klecan-Aker (1993)						✓		Cloze activities, explanation and examples of story grammar, multiple choice questions

Table 4

*Summary of Treatment characteristics, Maintenance, Generalization, Transcript Reliability, and PND*

Study	1:1	Small group	Large group	Home	School	Clinic	Sessions per week	Length of sessions (minutes)	Number of sessions	Total intervention time for each participant (minutes)	Mean intervention time (minutes)	Maintenance	Generalization	Transcript Reliability	PND (%)	PND (%)		
																Macrostructure	Combined	Overall PND
Single case research																		
Favot et al. (2018a)	✓				✓		4	3-8	21-52	120-300	188	✓	✓	✓	56		56	
Favot et al. (2018b)	✓				✓		4	4-10	16-47	85-200	168	✓	✓		70		70	
Finestack et al. (2017)	✓			✓			3	30-60	18	540-1080	810	✓	✓	✓		31 35	33	
Gillam et al. (2015)	✓					✓	2	50	21-33	950-1650	1485	✓			70	77	74	
Gillam et al. (2018)	✓				✓		2-3	34-47	13-24	608-846	722	✓		✓		69 80	75	
Hayward & Schneider (2000)		✓			✓		2	20	12 or 8	240 or 160	200			✓	71		71	
Klecan-Aker & Gill (2005)	✓						2	60	24	1440	1440				100	40	70	
Miller et al. (2018)	✓				✓		3	30	8-32	240-960	576			✓		82 24	53	
Petersen et al. (2014)	✓					✓	2 or 3	30 or 40	12	360 or 480	440	✓		✓	69	38	54	
Petersen et al. (2010)	✓							60	10	600	600	✓	✓	✓		72 34	53	
Shelton (1999)	✓					✓	2	25	8 or 5	250 or 125	186	✓			100	48	74	
Spencer et al. (2013)		✓			✓		2	10-15	24	240-360	300	✓				89	89	
Group studies																		
Bunning et al. (2017)		✓			✓		1											
Diez-Itza et al. (2018)	✓						1	20	4	80	80			✓				
Dodd et al. (2011)		✓			✓		3	30	18	540	540							
Fey et al. (2010)		✓				✓	2.4	60	10.5	630	630			✓				
Hayward & Schneider (2000)		✓			✓		2	20	12 or 8	240 or 160	200			✓				



Hettiarachchi (2016)		✓		✓	2		12						
Justice et al. (2008)	✓			✓						✓			
Pena et al. (2006)	✓					30	2	60	60			✓	
Petersen et al. (2008)		✓			4	90	16	1440	1440				
Petersen et al. (2016)	✓					25	2	50	50		✓	✓	
Swanson et al. (2005)	✓		✓	✓	3	50	18	960	960		✓		
Other													
Gillam & Gillam (2016)	✓			✓		45	33	1485	1485				
Klecan-Aker (1993)	✓				2	60	24	1440	1440				

Supplementary Table 1

## CEC Based Quality Appraisal

	Favot et al. (2018a)	Favot et al. (2018b)	Finestack et al. (2017)	Gillam et al. (2015)	Gillam et al. (2018)	Hayward & Schneider (2000)	Klecan-Aker & Gill (2005)	Miller, Correa, & Katsiyannis (2018)	Petersen et al. (2014)	Petersen et al. (2010)	Shelton (1999)	Spencer et al. (2013)
Description of participants and setting												
Statement of diagnosis such as autism, ASD, Asperger's syndrome, intellectual disability, (with or without indicating diagnostic source) age, and gender	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Diagnostic instrument specified for primary diagnosis (e.g., WISC, DSM-IV or DSM 5 criteria, and ADOS)	✓	✓	✓	✗	✓	✓	✗	✗	✓	✓	✗	✓
If ASD, degree of autism specified either with reference to symptoms (DSM-IV, DSM 5) or instrument like CARS. If not ASD award point	✓	✓	✓	✗	✓	✗	✗	✓	✗	✓	✓	✗
Standardized assessment data (e.g., IQ, developmental scale, adaptive behavior) or detailed functional description of general ability. Disability range (e.g., mild) acceptable for intellectual disability	✓	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✓
Communication skills documented by means of standardized test results OR description of functional skills	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✗
The process for selecting participants is described with replicable precision. MUST describe the process used to select participants not just describe the participants or their needs. This would generally include the criteria they must meet (e.g., 3-5 years, less than 5 spoken words) <b>and</b> the process for selecting participants (e.g., first 5 children on the wait list). Authors must	✗	✓	✗	✗	✗	✓	✗	✗	✓	✗	✗	✓

explicitly state HOW/WHY participants were selected												
Critical features of the setting are described with sufficient precision to allow replication	✓	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓	✗
Dependent variables												
All dependent variables are described with replicable precision	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Each dependent variable is measured with a procedure that generates a quantifiable index	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The measurement process is described with replicable precision	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dependent variables are measured repeatedly over time	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Data are collected on the reliability or inter-observer agreement (IOA) associated with each dependent variable. Levels must meet minimal standards (e.g., IOA=80%; Kappa=60%), must be on minimum of 20% of sessions	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
Independent variable												
Independent variable is measured with replicable precision	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Independent variable is systematically manipulated and under the control of the experimenter, with the researcher determining when and how the variables change	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Overt measurement of the fidelity of implementation is highly desirable. MUST be measured on a minimum of 20% of sessions	✓	✓	✓	✗	✓	✗	✗	✓	✓	✓	✗	✗
Baseline												
A baseline phase provides repeated measurement of a dependent variable and establishes a pattern of responding that can be used to predict the pattern of future performance if introduction or manipulation of the independent variable did not occur. Should include a minimum of 5 stable data points. High variability is acceptable if intervention effects are unambiguous. Baseline optional for alternating treatments design. 2/3 of baselines must be acceptable	✓	✓	✗	✓	✗	✗	✗	✓	✓	✓	✓	✗

The procedural characteristics of the baseline conditions should be described operationally	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Experimental control/ Internal validity												
The design controls for common threats to internal validity (e.g., permits elimination of rival hypotheses). Acceptable designs include concurrent multiple baseline, non-concurrent multiple baseline with a priori specification of both baseline durations and random assignment of participants to baseline durations, ABAB and alternating treatments with counterbalancing. Award half point: multiple baseline with probe. Award no points: AB, ABAC, non-concurrent multiple baseline without a specified a priori random assignment and changing criterion	1/2	1/2	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
Design must score above for point to be awarded. The design provides at least 3 demonstrations of experimental effect at different points in time. Experimental effects must be unequivocal in relation to baseline data and trends. Effects of alternating treatments may be added, as main comparison is not with baseline. When there are more than 3 possible demonstrations of experimental control, 75% or more must actually demonstrate control unequivocally	✓	✗	✗	✓	✗	✗	✗	✓	✓	✗	✗	✓
External validity												
Experimental effects are replicated across participants, settings, or materials to establish external validity. At least 3 participants, settings or materials must be apparent	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓
Social validity												
The dependent variable is socially important	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Implementation of the independent variable is practical and cost effective. Code if acceptability practicality or cost effectiveness is formally and directly measured (e.g., via a questionnaire such as the intervention rating profile-15, estimation of treatment costs)	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓

Social validity is enhanced by implementation of the independent variable over extended periods, by typical intervention agents, in typical physical and social contexts. Extended time is more than 2 months, extended follow up is acceptable. Only need 1 characteristic	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓	✗	✓
Social validity of the impact of intervention is formally assessed (e.g., questionnaire to caregivers to assess perceived improvement in communication or quality of life)	✓	✓	✓	✗	✗	✗	✗	✓	✗	✓	✗	✓
Quality total	53	54	53.5	52.3	45	45	26.9	56.8	55.7	54.6	39.8	52.3

Supplementary Table 2

*What Works Clearinghouse Quality Appraisal*

Criteria	Favot et al. (2018a)	Favot et al. (2018b)	Finestack et al. (2017)	Gillam et al. (2015)	Gillam et al. (2018)	Hayward & Schneider (2000)	Klecan-Aker & Gill (2005)	Miller et al. (2018)	Petersen et al. (2010)	Petersen et al. (2014)	Shelton (1999)	Spencer et al. (2013)
Independent variable must be systematically manipulated with researcher determining when and how independent variable conditions change.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Each dependent variable must be measured systematically (i.e., repeatedly) over time by more than one assessor.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Inter assessor agreement must be collected on at least 20% of the data points.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Inter assessor agreement must meet minimum thresholds (IOA 80%, Kappa .60)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The study must include at least 3 attempts to demonstrate an intervention effect at 3 different points in time or with 3 different phase repetitions. A minimum of 3 phase contrasts are required to meet this standard. Examples of designs to meet the standard includes ABAB, multiple baseline with at least 3 baseline conditions, alternating/simultaneous treatment designs. Designs not meeting the standard are AB, ABA, BAB).	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓	✗	✓
If studies do not score for all above, they do not meet evidence standards. If studies score for all above, then score below.					*	*	*				*	
For a phase to qualify as an attempt to demonstrate an effect the phase must have a minimum of 3 data points for all participants in the study	2	2	1	2				2	1	1		1
ABAB design (reversal design)												
<i>To meet standards without reservations</i> (score 2), minimum of 4 phases per case and 5 data points per phases												
<i>To meet standards with reservations</i> (score 1), minimum 4 phases per case with at least 3 data points per phase												
Multiple baseline and multiple probe design												
<i>To meet standards without reservations</i> (score 2), minimum 6 phases per case												

with at least 5 data points per phase

*To meet standards with reservations* (score 1), minimum 6 phases with at least 3 data points per phase

*No evidence* (score 0), does not provide 3 demonstrations of control

If study is a multiple baseline with probe the following criteria must also be met, failure to meet any of these results in a study rating on Does not meet WWC SCD standards

Initial pre-intervention sessions must overlap vertically

1

2

2

*To meet standards without reservations* - Within the first three sessions design must include 3 consecutive probe points for each case

*To meet standards with reservations* - Within the first three sessions at least 1 probe point for each case

Probe points must be available just prior to introducing the IV

1

2

1

*To meet standards without reservations* - design must include 3 consecutive probe points just prior to introducing IV

*To meet standards with reservations* - at least 1 probe point just prior to introducing IV

Each case not receiving intervention must have a probe point in a session where another case either a) first receives intervention, or b) reaches the prespecified intervention criterion. This point must be consistent in level and trend with the case's previous baseline points.

2

0

2

If study meets standards or standards with reservations, then complete below

Strong evidence of causal relationship (single case design with at least 3 demonstrations of an intervention effect and no non effects)

Moderate evidence of a causal relationship (single case design with at least 3 demonstrations of an intervention effect and at least 1 non effect)

No evidence of causal relationship (single case with fewer than 3 demonstrations of an intervention effect)

Macro (icons, photo only) - no evidence

Macro (no icons) - no evidence, macro (icons) - moderate evidence

Macro, combined, other - no evidence

Macro, combined - no evidence

Macro - strong evidence , micro - no evidence

Macro - strong evidence , micro - moderate evidence

Macro strong evidence , micro (causality) strong evidence , micro (TASC) - no evidence

Macro - strong evidence

Note. \* = Does not meet evidence standards

Supplementary Table 3

*Quality – group studies*

Criteria	Dodd et al. (2011)	Fey et al. (2010)	Pena et al. (2006)	Petersen et al. (2016)
Random assignment to group 2 points - randomized using an acceptable method (e.g., random number table) 1 point - randomized but method not detailed 0 points - not randomized or inappropriate method (e.g., date of birth)	1	0	0	0
Initial group similarity / pretest equivalence 2 points - groups demonstrated to be statistically equivalent at pretest on all outcome measures 1 point - groups equivalent on some outcome measures 0 points - no examined or not adjusted for	0	2	0	2
Blinding 2 points - assessors blind to group allocation on all measures 1 point - assessors blind to allocation on some measures 0 points - assessors not blind to allocation	0	2	2	2
Attrition 2 points - differential attrition with 10% for all study groups 0 points - not within 10%	2	0	2	2
Incomplete data or selective reporting 2 points - complete or near complete data available on all nominated outcomes, missing data explained. Sufficient data provided on all specified outcomes to allow entry into meta-analysis (e.g., group sizes means and SDs for all outcomes. 1 point - complete or near complete data available on all primary outcomes but inadequately explained missing data on at least one secondary outcome. Sufficient data provided on all primary and secondary outcomes to allow entry into meta-analysis. 0 points: Incomplete data available on at least one primary outcome or insufficient data provided for any specified outcomes to allow entry into meta-analysis (e.g., only providing data on significant outcomes).	2	2	2	2
	5	6	6	8



Figure 1. Flow chart of information through the literature review.

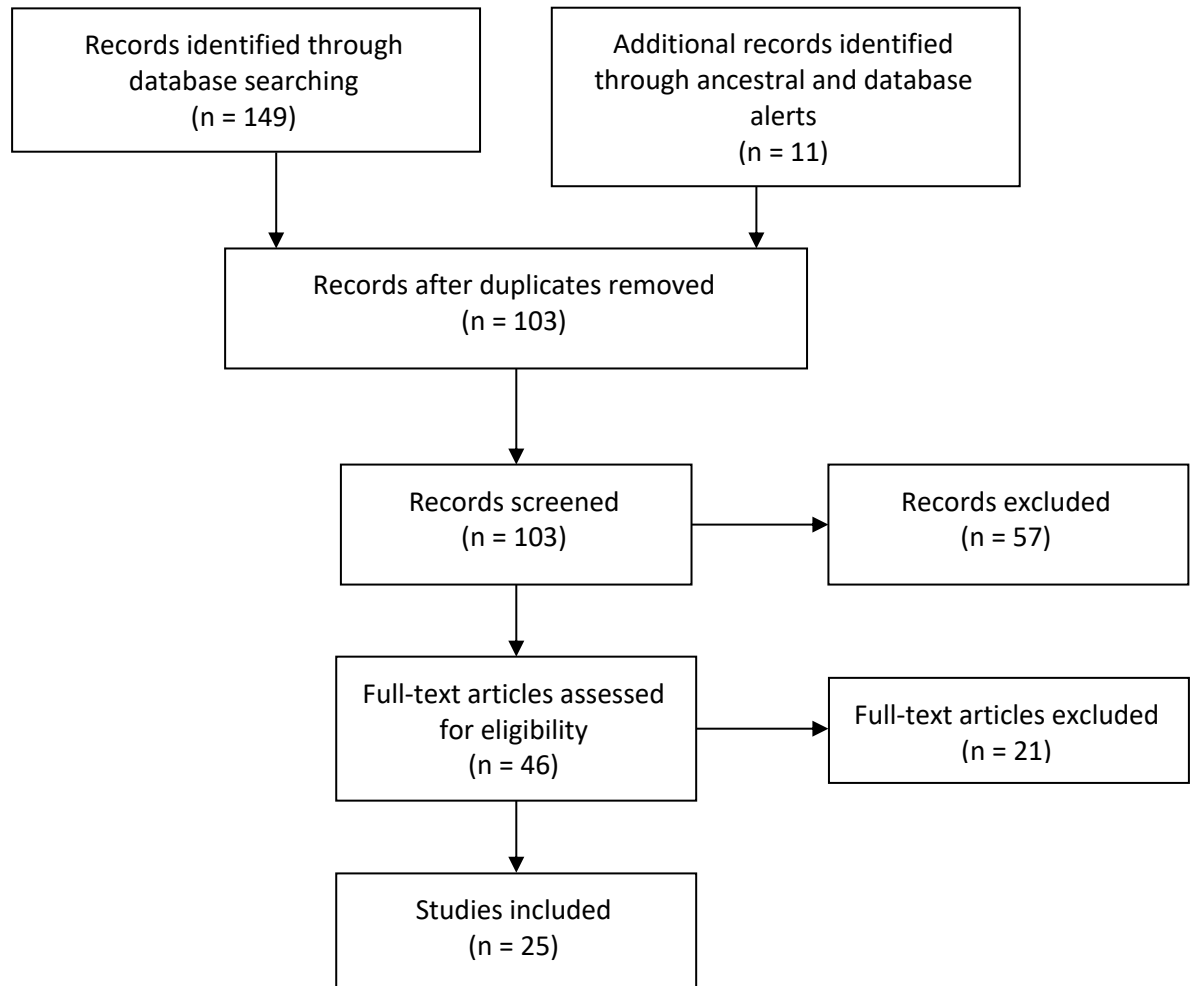
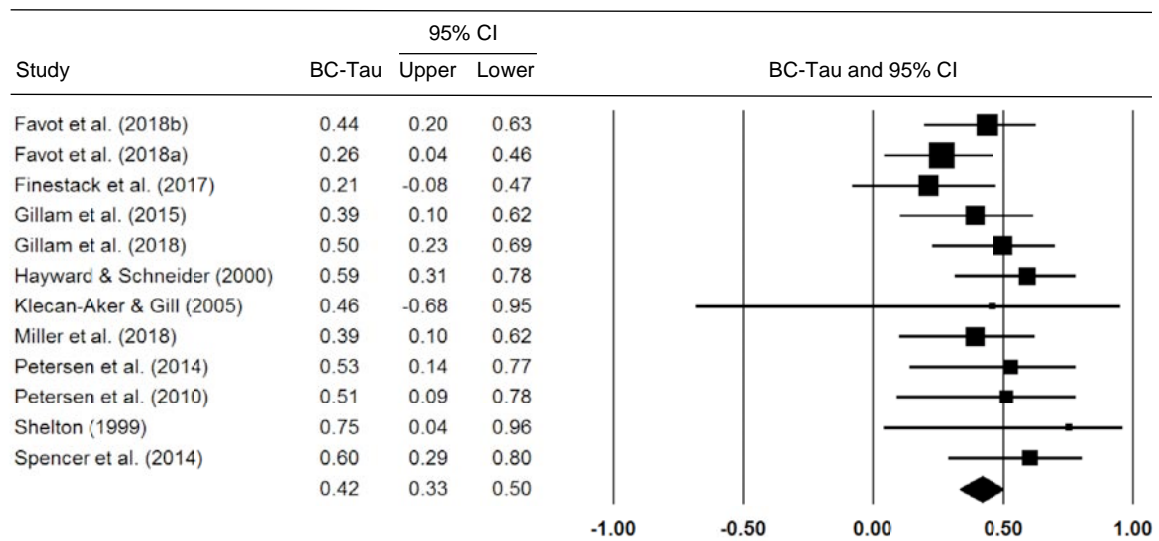


Figure 2. Forest plot of overall results for baseline correct tau for single-case studies



### **Chapter 3: The effects of an oral narrative intervention on the personal narratives of children with ASD and severe language disorder.**

#### **Chapter Overview**

This chapter consists of a manuscript published in the Journal of Behavioral Education, “The effects of an oral narrative intervention on the personal narratives of children with autism spectrum disorder (ASD) and severe language disorder”. This current intervention study was a replication of a pilot study (Favot, Carter, & Stephenson, 2018) conducted in fulfillment of a Master of Research degree (see Appendix 1 of this thesis). A systematic literature review (Chapter 2) showed limited research that investigated the effects of intervention on the personal narratives of children with ASD and severe language disorder and that the existing research included limited measures of generalisation. A multiple baseline with probe design was used to investigate the effects of intervention on the macrostructural elements of personal narrative in four participants with ASD and severe language disorder aged between 6 and 7 years of age. Intervention and maintenance effects were demonstrated for three participants and one participant demonstrated some evidence of generalisation across settings, people and stimuli. This research represents one of the first personal narrative interventions in children with ASD and severe language disorder and was the first to include extensive measures of generalisation.

(The published version of this manuscript contains a misalignment of the last three columns in Table 1. This error was not corrected by the production team after the galley proofs had been approved. An ERRATUM is in progress. A corrected table is included as Appendix A of this chapter.)

### References

Favot, K., Carter, M., & Stephenson, J. (2018). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language impairment: A pilot study. *International Journal of Disability, Development and Education*, 492-509. doi:10.1007/s10882-018-9608-y

### Publication Status

Favot, K., Carter, M., & Stephenson, J. (2019). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language disorder. *Journal of Behavioral Education*. Advance online publication. doi:10.1007/s10864-019-09354-5



## The Effects of Oral Narrative Intervention on the Personal Narratives of Children with ASD and Severe Language Disorder

Kate Favot<sup>1</sup> · Mark Carter<sup>1</sup> · Jennifer Stephenson<sup>1</sup>

© Springer Science+Business Media, LLC, part of Springer Nature 2019

### Abstract

A multiple baseline with probe across participants design was used to investigate the effects of an oral narrative intervention on early developing personal narratives of four children aged 6 and 7 with autism spectrum disorder and severe language disorder. The individual intervention targeted the narrative macrostructure elements of *where*, *who with*, *what happened* and *feelings*. Intervention involved the use of individual photographs to support each narrative, macrostructure icons, participants telling the entire narrative each session, and modeling. Using variations of the intervention, an intervention and maintenance effect using untaught narratives was demonstrated for three participants, and some evidence for generalization across settings, people, and stimuli was demonstrated for one participant. Social validity measures indicated that an objective naïve observer rated post-intervention narratives as better. Areas for future research include implementing intervention to better provide for generalization of skills, delivering intervention to small groups, and classroom teachers implementing the intervention.

**Keywords** Personal narrative intervention · Autism spectrum disorder · Language disorder · Children · Multiple baseline design

---

✉ Kate Favot  
kate.favot@mq.edu.au

Mark Carter  
mark.carter@mq.edu.au

Jennifer Stephenson  
jennifer.stephenson@mq.edu.au

<sup>1</sup> MUSEC School, Macquarie University, Sydney, NSW 2109, Australia

Published online: 29 October 2019

Springer

## Introduction

Narratives are reports of events that may be real or fictional (Lahey 1988). They may take the form of a recount of a personal event (e.g., what you did on the weekend), retelling a story, or generation of an original fictional story. Narrative language is typically decontextualized (Peterson et al. 1999), causally related, and temporally ordered (Hughes et al. 1997) with thematically related plot structures (Gillam and Pearson 2017).

Narratives have a broad importance. They are an authentic context in which to develop skills in organizing abstract and complex thinking, and sequencing (Petersen 2011) and have been found to be a predictor of both language (Bishop and Edmundson 1987) and academic development (Hughes et al. 1997). Teaching children to generate oral narrative has been linked to the development of written narrative (Spencer and Petersen 2018), and the capacity to answer literal, inferential, and critical thinking comprehension questions (Morrow 1985). In addition, narrative skills have been linked to the development of autobiographical memories (Reese and Newcombe 2007), and forming connectedness and group identity in friendship groups (Cheshire 2000).

Personal narratives are a class of narratives that describe and evaluate personally or vicariously experienced events (Preece 1987). They are the earliest developing extended discourse (Hedberg and Westby 1993), and researchers have identified different types of personal narratives (McCabe and Rollins 1994; Shiro 2003) which children may start to produce from 2 years of age (Allen et al. 1994; McCabe and Rollins 1994). Scripts are adult supported (Eisenberg 1985) representations of frequently occurring (Shiro 2003), personally experienced events, such as going to the doctor or birthday parties. From approximately 3 years of age, children talk about specific personally experienced past events (Eisenberg 1985). From three children generate “recounts” in response to adult questioning and spontaneously generated “accounts” (Gillam and Pearson 2017). Classic high point narratives, which include a problem and a climax, develop from around the age of five (McCabe and Rollins 1994) and continue to develop in sophistication into adulthood.

Narrative macrostructure provides a framework for overall narrative structure and content (Finestack 2012). The macrostructure of personal narrative typically includes who was involved, what happened, where the event happened, and an evaluation (Favot et al. 2018b; Nathanson et al. 2007). Researchers have described macrostructure features as being inherent to narrative (Peterson and McCabe 1991; Sperry and Sperry 1996) with microstructural elements, such as syntactical conventions supporting the macrostructure.

Formulating a personal narrative places cognitive and linguistic demands on the speaker (Green and Klecan-Aker 2012). Cognitively, the narrator is required to understand and remember the past event (Hudson and Shapiro 1991) and then to understand the relevance of that past event to the current discussion (Loveland et al. 1990). From a linguistic perspective, they are then required to organize and produce a version of the event using conventional macrostructure (Hudson and Shapiro 1991) and microstructure.

Many children may learn to produce fictional and personal narrative incidentally (Pakulski and Kaderavek 2012). It is not so for all children and researchers have profiled narrative deficiencies in individuals with autism spectrum disorder (ASD; Banney et al. 2015; Colozzo et al. 2015; King et al. 2013) and other disabilities (Boudreau and Chapman 2000; Colozzo et al. 2011; McCabe et al. 2008). Baixauli et al. (2016) conducted a meta-analysis of 24 investigations of narrative production in children with ASD and concluded that deficits exist in both narrative macrostructure and microstructure. Personal narratives were investigated in five of the 24 studies (Bang et al. 2013; Brown et al. 2012; King et al. 2013; Losh and Capps 2003; Mills et al. 2013). The authors concluded that individuals with ASD produce fewer and shorter personal narratives than typically developing peers (Bang et al. 2013), utilize a smaller range of words (King et al. 2013), have difficulty inferring and building causal relationships (Losh and Capps 2003), and include fewer emotional and cognitive terms (Brown et al. 2012).

To date, researchers in four studies have examined the efficacy of oral narrative intervention on the macrostructure of oral narratives in children with ASD (Favot et al. 2018a, b; Gillam et al. 2015; Petersen et al. 2014) and concluded that oral narrative intervention may be effective. All participants in all four studies had documented language disorders or were described as having language problems specific to the use of narrative. Participants with low verbal IQs were included in two studies (Favot et al. 2018a, b). All four studies used multiple baseline designs, and intervention included the use of macrostructure icons, the clinician modeling narrative, and the opportunity for participants to produce an entire narrative as part of the intervention.

Researchers in two studies have examined the effect of oral narrative intervention on the macrostructure of personal narrative. Petersen et al. (2014) investigated the effect of intervention on three participants' capacity to generate individually targeted single macrostructure elements in a high point personal narrative. Authors reported the intervention as effective, and some evidence of maintenance was displayed. Generalization was not examined in this study, and the authors note that a limitation to the study is that probe data were collected at the end of the intervention session (Petersen et al. 2014). Favot et al. (2018b) reported on a pilot study that investigated the effect of a narrative intervention on the combined macrostructure (*where, who with, what and feelings*) of early developing personal narrative. The intervention was effective to some degree for all four participants, and maintenance and generalization to different settings occurred. Nevertheless, refinements occurred during this pilot study, including variations of the intensity of intervention, and strategies to address perseverative behavior. In addition, there was a lack of generalization of the learned skill to different people, and difficulties for one participant in making the link between generating narratives using macrostructure icons as support and being able to generate a narrative without the icons as support.

Given the importance of narrative to social and academic success and the difficulties with narrative that individuals with ASD experience (Baixauli et al. 2016), it is a logical area for language intervention (Brown et al. 2014). This study develops existing research by extending intervention procedures used in the pilot study (Favot et al. 2018b) to include a contingency for scaffolded fading of icons in the

intervention, a wider range of stimulus photographs, classroom teachers delivering the intervention and increasing the scope of generalization probes. The following research questions were investigated including (a) does individualized oral narrative intervention have an effect on the macrostructure of personal narratives produced by school-aged children with ASD and severe language disorder?; (b) do improvements in the macrostructure of personal narratives produced by school-aged children with ASD and severe language disorder maintain after intervention has been withdrawn?; and (c) do improvements in the macrostructure of personal narratives produced by school-aged children with ASD and severe language disorder generalize to other people and settings?

## Method

### Participants and Setting

Four children, two girls, and two boys took part in the study. All participants attended the university-based special education demonstration program where the intervention took place. Participants attended the program Monday to Friday and were provided with a comprehensive educational program. The University research ethics committee approved the research conducted in this study.

Participants met the following criteria: they (a) had a diagnosis of ASD from an independent pediatrician or psychologist; (b) had a severe receptive and expressive language disorder, according to results from standardized language assessments; (c) had English as their primary language; (d) had speech intelligible to non-familiar listeners as judged by the first author; (e) were able to sit at a table and participate in instruction for 10–15 min, as reported by classroom teachers; (f) spoke using a minimum of two word utterances (g) did not include information pertaining to all of the following elements in their personal narratives: *where*, *who with*, *what*, and *feelings* when assessed using a narrative screener; (h) had parents who agreed to provide two weekly personal narratives with accompanying photographs to the researcher. The participants' classroom teachers completed the Childhood Autism Rating Scale, Second Edition (Schopler et al. 2010) to determine the severity of symptoms of ASD for each participant.

The first author, also the school Speech and Language Pathologist, conducted language assessments for all participants using the Clinical Evaluation of Language Fundamentals Australian and New Zealand Standardised Edition, Fifth Edition (Wiig et al. 2017), and the Peabody Picture Vocabulary Test, Fourth Edition (Dunn and Dunn 2007). The receptive language for one participant was assessed using the Test for Reception of Grammar, Second Edition (Bishop 2003). The results of these assessments are included in Table 1.

Before intervention began, the first author conducted an informal picture description exercise and observed the participants in the classroom and playground. The picture description task indicated that all participants were able to use key information words to convey a message. Lorcan and Cormac were generally able to use grammatically simple sentences (e.g., the dog is sleeping). Based



**Table 1** Participant description

Name	Age (years, months)	Diagnosis	Adaptive behavior	IQ	CELF-5		TROG-2	PPVT-4	CARS-2	Personal narrative screener—macrostructure elements included
					Receptive	Expressive				
Lily	6; 6	ASD (DSM-5)	Extremely low (ABAS-II)		SS 67 Severe disorder	SS 55 Severe disorder		SS 75 2nd percentile moderately low	What	Minimal to no symptoms
Lorcan	7; 7	ASD (DSM-5)		Verbal IQ mild delay (SB-5)		SS 47 Severe disorder	SS 55 Below 1 <sup>st</sup> percentile	SS 66 1 <sup>st</sup> percentile extremely low	What	Severe
Cormac	6; 10	Autism spectrum range (CARS-2)	Mild impairment (Vineland-II)	Full scale mild impairment Verbal IQ borderline (SB-5)	SS 61 Severe disorder	SS 52 Severe disorder		SS 76 percentile moderately low	None	Mild to moderate symptoms
Siobhan	6; 5	ASD (DSM-5)	Below average (ABAS-3)	Fluid reasoning 4th percentile, non verbal borderline (WPPSI-IV)	SS 67 Severe disorder	SS 57 Severe disorder		SS 68 1st percentile extremely low	Who with	Mild to moderate symptoms

DSM-5 Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association 2013); CARS-2 Childhood Autism Rating Scales, Second Edition (Schopler et al. 2010); ABAS-II Adaptive Behavior Assessment System, Second Edition (Harrison and Oakland 2015); ABAS-3 Adaptive Behavior Assessment System, Third Edition (Harrison and Oakland 2015); Vineland-II Vineland Adaptive Behavior Scales, Second Edition (Sparrow et al. 2005); SB-5 Stanford-Binet Intelligence Scale, Fifth Edition (Roid 2003); WPPSI-IV Wechsler Preschool and Primary Scale of Intelligence, Fourth Edition (Wechsler 2012); CELF-5 Clinical Evaluation of Language Fundamentals, Fifth Edition Australian and New Zealand Standardised Edition (Wrig et al. 2017); TROG-2 Test for the Reception of Grammar, Second Edition (Bishop 2003); PPVT-4 Peabody Picture Vocabulary Test, Fourth Edition (Dunn and Dunn 2007); SS standard score

on the picture description task, their mean length of utterances was as follows: Lily, 4.9; Lorcan, 4.2; Cormac, 6.1; and Siobhan, 5.5. Lily, Cormac, and Siobhan participated in whole group class activities, initiated verbal communication with teachers and peers, and participated in a range of play activities. Lorcan was able to sit on the mat during whole class activities and when asked a question by the teacher would often repeat, rather than answer the question.

## Materials

Participants' families were asked to prepare two narratives each week that related to events during the previous weekend and to email them to the researcher, ready for use on Monday of each week. A Microsoft Word or PowerPoint template was sent home to assist in the weekly preparation. Information about the intervention was provided to parents through a phone call and a follow-up letter that outlined the targeted narrative structure and provided examples, and requested a range of activities and people be represented in the narratives. Each Monday morning, one of the narratives was randomly selected as the weekly probe stimulus and the other narrative was used for the intervention if the child was receiving intervention. If the participant was not receiving intervention the second narrative was kept aside for later use in classroom language activities. Narratives contained information that could inform a response to the cue, "Tell me about your weekend." Families were asked to include information about *where* the event happened (it could be "at home"), *who* was present, *what* they did, and the participant's *feelings* about the event. Families were also asked to provide photographs that clearly represented the participant at each location. They were asked not to discuss the narratives or materials with the participants. If parents did not provide the materials ready for use on Monday mornings, they were contacted and reminded to send their narratives. Reminder emails were sent to one family on ten occasions and materials were received the next day. This did not impact on baseline data collection or intervention. When the information was received, the photographs were printed in color. All photographs were approximately 15 cm × 10 cm.

While the participants were in the intervention phase, the researcher also prepared one or two intervention narratives using photographs taken by classroom teachers during school-based activities. These narratives were to promote generalization. These materials contained information, presented in the format described above that could inform a response to the cue "tell me what you did at school."

Picture Communication Symbols (Boardmaker<sup>®</sup> (Version 6) [Computer software] 2008) representing *where*, *who with*, *what*, and *feelings* were used as macrostructure icons (visual supports) to represent each of the macrostructure components of personal narrative. The symbols were printed in color onto cards approximately 5 cm by 5 cm and were laminated. The photographs and icons were attached with magnets to a whiteboard (40 × 30 cm) in each session.

### Dependent Variables

The primary dependent variable was the macrostructure of personal narrative in the no-icons condition. The secondary dependent variable was the macrostructure of personal narrative in the icons condition. Details outlining where, who with, what happened, and a personal response have been established as four key macrostructure components of a personal narrative (Nathanson et al. 2007; Rixon and Jaeger 2011). Each of the four macrostructure components of the personal narrative was scored for the presence (one point) and accuracy (one point), with a total possible score of eight for each narrative. Accuracy was established by reference to the information provided by parents or verification after the session. Information relating to the macrostructure elements was not required to be presented in grammatically correct structures or in a set order. Responses of any length, including single words, were acceptable. Explanations of each element of the personal narrative and examples are provided in Table 2.

### Baseline and Intervention Probes

The first author collected all probes with the participant seated beside the first author at a table in a room next to the participant's classroom. All probe collection was scripted to standardize interactions. Both no icon and icon probes were collected in all probe collection sessions. Prior to "true" (Horner and Baer 1978) baseline weekly probes were collected. When the participants entered the true baseline phase, at least five daily probes were collected and when participants were receiving intervention, daily probes were collected before the intervention component of the session.

True baseline began with the first participant while weekly baseline probe sessions were conducted with the other three participants. When baseline data collected from the first participant were stable across at least five data points in both, the no-icons and icons probes intervention began. When an intervention effect was demonstrated, daily (true) baseline probes began with the second participant.

All probes were video recorded on an iPhone and downloaded onto a computer and an external hard drive after the sessions to allow for collection of interrater and procedural reliability. All participant responses were transcribed verbatim from the video recording.

Two data collection probes were conducted during each session. The first probe was the no-icons condition. The photograph was attached with a magnet to an inclined whiteboard in front of the participant. The researcher got the participant's attention and asked what they did on the weekend. When the participant stopped talking for three seconds, or when the interventionist judged they had finished, the no-icons probe condition was finished and the researcher thanked the participant. The researcher made no other comments on the narrative.

The second probe condition, the icons condition, took place straight after the first. The same procedures were used and the stimulus photograph used in the no-icons condition remained on the white board. The macrostructure icons to represent

Table 2 Definitions for dependent variables

Element	Criteria for element	Example	
		Acceptable	Unacceptable
Where the event happened ( <i>where</i> )	Naming a specific place	To the beach Stayed at home	There That place
Who was present ( <i>who with</i> )	Naming people by name or relationship	My mum My sister Graham	Her The people
What the participant did there ( <i>what</i> )	Names an activity	<i>Jumped</i> in the waves <i>Played</i> with my friends	Did that
Feelings or personal reaction ( <i>feelings</i> )	Description of emotion or reaction	It was fun	The end That's it

*where, who with, what, and feelings* were placed across the top of the whiteboard above the photograph, left to right in the stated order. No explanation was provided regarding the icons.

After Lorcan had received two intervention sessions, a decision was made to terminate his probe collection if he perseverated on any word or phrase three or more times. This was implemented only for Lorcan.

### **Teacher Training**

The first author trained the classroom teacher. Training involved explanation of the program, reading the intervention procedure, watching clips of the first author delivering the program while identifying each step, and practice delivering the intervention with individuals not involved in the intervention. The practice sessions were video recorded. The first author provided feedback to the teacher and training continued until the teacher performed all steps correctly. Once the teacher began implementing the intervention with the participants, the first author attended and rated the first intervention session according to the procedural reliability checklist and then provided feedback after the session. Any errors in implementation were discussed. Including the classroom teacher in the intervention was designed to assist in generalization of skills to other people. It was initially planned that the classroom teacher would deliver one intervention session per week for each participant. Lily received nine sessions from the teacher. Due to the number of changes made to Lorcan's intervention procedure and the practical considerations involved around re-training the teacher for each change, Lorcan received only three intervention sessions from the class teacher. Cormac received only one session from the teacher due to absences from the teacher and himself. Siobhan did not receive any from the teacher due to classroom organizational issues (e.g., teacher absences, changes in classroom scheduling).

### **Experimental Design**

A multiple baseline with probe design across participants was implemented to determine the effect of a narrative intervention on the macrostructure of participants' personal narratives. Maintenance probes and generalization probes across settings, and people were collected for all participants.

### **Intervention**

Intervention occurred immediately after the probe collection and was conducted by the same interventionist who collected the probe. The intervention was conducted by the first author and by a classroom teacher trained in the procedure.

The intervention included materials and strategies used with other populations in previous interventions to develop the macrostructure of narrative. These materials and strategies included the use of macrostructure icons, use of pictures to represent specific narratives, modeling, and requiring the participants to produce an entire

narrative each intervention session (Favot et al. 2018a, b; Petersen et al. 2014). The intervention was designed to enable the participants to produce each of the macrostructure elements of the narrative individually and then combine the elements to tell the entire narrative independently at the end of each session.

The board was presented with the icons placed above the first intervention photograph. The interventionist asked the participant about their weekend, or what they did at school (e.g., “What did you do on the weekend?” “What did you do at school?”). The interventionist then immediately elicited the *where* information (e.g., “Where did you go?”), while pointing to the *where* icon. If the participant gave a correct response, the interventionist repeated their response then stated that the participant had given the *where* (e.g., “You told me where.”). The *where* icon was then moved to the bottom of the board. If the participant made no response or an incorrect response to the *where* question, the interventionist implemented a correction procedure. This involved stating the correct information for the macrostructure component and then repeating the question (e.g., “Where did you go?”). Regardless of the participant’s response (correct, incorrect, no response), the interventionist stated the correct answer and then named the component (e.g., “That’s where.”), and moved the *where* icon to the bottom of the board. The intervention procedure was designed to minimize errors; therefore, participants were provided with only one opportunity to correct errors themselves before being provided with a corrective model. In addition, this enabled the maintenance of fast pacing of instruction. The same procedure was followed to elicit information for the remaining components. At the end of this stage of the intervention, all icons were under the photograph in the order of elicitation.

Next, the interventionist pointed to the icon for *where* and asked the participant to say the whole narrative. As the participant provided information for each component, the interventionist pointed to the next icon. If the participant provided incorrect or no information for any element, the interventionist immediately provided the correct information for the whole of the component and pointed to the next icon. The participant was not asked to repeat the information. When the participant finished the narrative, the interventionist then modeled the narrative back to the participant in an affirming way. The interventionist used the same information words as the participant but with correct grammar.

If any content errors were made when the participant provided the first entire narrative, then the interventionist provided a second opportunity to state the whole narrative. The interventionist provided immediate corrective feedback if the participant made an error or missed any information. The procedure was repeated with the second intervention narrative.

If the participant gave the entire narrative before teaching had started, the interventionist waited until the participant had finished and then acknowledged that they had included each component while simultaneously moving the icon to the bottom of the board. The interventionist then began intervention with the next narrative or concluded the session. If the participant provided the information for any macrostructure element before the interventionist elicited the information, the interventionist nonverbally indicated for the participant to stop and then elicited the information.

### Planned Fading of Icons

A two-step structured fading of icons was planned as phases II and III of the intervention. This was planned to be implemented only if the participant scored 8 points in the probe icons condition on 5 out of 6 days (to ensure they scored 8 using at least two different stimulus photographs) but did not score 8 in the no-icons condition. In phase II, the icons were presented at the beginning of the intervention session, with the intervention photograph below. The participant was reminded to include *where*, *who with*, *what*, and *feelings* while the interventionist pointed to each icon card. The icon cards were then taken off the board. The interventionist then asked the participant about their weekend or what they did at school, pointed to the place where the icon for *where* would have been and straight away asked, “where did you go?” After the participant had given the correct response or the interventionist had modeled the correct response, the interventionist pointed to the place under the photograph where the icon for *where* would have been placed. The remaining macrostructure elements were elicited in the same way. After the elements had been elicited, the interventionist requested the participant to say the entire narrative and pointed to the place where the icon for *where* would have been as a cue to begin. The remainder of the session was conducted as in the first intervention phase but without the icons on the board.

Phase III was implemented when the participants reached the criterion of saying the entire narrative at the first opportunity in the intervention for 80% of opportunities over 4 days. In the second step, the interventionist reminded the participant that when they talk about what they did, they should include *where*, *who with*, *what* and *feeling* and then placed the intervention photograph on the whiteboard. The teaching procedure was as described above, except that the adult did not point to the board at any time during the teaching procedure. Only Lily received phases II and III as planned.

### Variations to Intervention Procedure

After 17 intervention sessions in phase I, Lorcan’s intervention was amended and he did not receive the preplanned icon fading phases. He was able to say a complete narrative at the end of the intervention session, but was not demonstrating that skill in either the no icon or icon probe. Analysis of the probe data indicated that he was perseverating on the “what” element of each narrative. Several phase changes (II–VII) were implemented to his intervention procedure, but the changes did not result in improvement until the number of intervention narratives per session increased, the number of opportunities to say each narrative was increased to at least three, and all episodes of perseveration were interrupted with the first author immediately prompting for another piece of information. Table 3 provides a summary of each phase change. These changes were only for Lorcan.

After seven intervention sessions in phase I, Cormac’s intervention was also amended (phase II), as his scores were not improving in either condition. He did

**Table 3** Key variations to Lorcean's intervention procedure

Phase change	Key variation	Rationale
II	One additional opportunity at the end of the intervention to practise each intervention narrative with icons moved to top of board	Additional opportunity to respond
III	Phase change 2 plus verbal prompt "tell me everything about your weekend" when participant initially perseverates (repetition $\times 3$ ) on "what" element	Interrupt and redirect perseveration
IV	Researcher requests entire narrative from beginning of intervention session, pointing near "where" icon, when participant stops talking or perseverates researcher prompts "what else, tell me more" prompt with "I" when perseverate on "what" element	Interrupt and redirect perseveration
V	Icons at top of board, researcher begins intervention by modeling entire narrative, then says "now you say it," prompt with "I" when perseverates on "what" element	Providing model and interrupt and redirect perseveration
VI	Icons not used, researcher requests entire narrative, when participant stops talking or perseverates the researcher prompts with "what else, tell me more" prompt with "I" when perseverates on "what" element	Interrupt and redirect perseveration
VII	Phase change 6 plus increased opportunities to practise each entire narrative up to three times in quick succession and hear model after each practise	Increased opportunities to respond



not receive the preplanned fading of icons phases. An additional step was added at the end of his intervention, and he was given extra practise in saying the entire narratives. After all intervention narratives for the session had been elicited and practised, the icons remained at the bottom of the board and he was asked to say each narrative again in response to each photograph being put back on the white-board and a verbal cue. Immediate corrections were made if any component was missing or incorrect. After he had finished saying the entire narrative again the interventionist modeled the entire narrative.

### **Maintenance and Generalization Probes**

Maintenance probes were collected after the intervention had finished. Participants were moved to maintenance when their performance stabilized after an intervention effect had been demonstrated. The same procedure was used as in no-icons and icons probe data collection. Four sets of generalization data were collected involving variations in setting, partner(s), whether the narrative was volunteered or elicited, and the stimuli used. See Table 4 for details of each condition.

### **Transcript Reliability**

A research assistant was trained to transcribe the narratives from the video of the probe sessions. The research assistant had a copy of each photograph and information sent from home. Training involved instruction to listen to the recordings as many times as required and at reduced speed if necessary, to transcribe probes verbatim, including all false starts, repetitions, idiosyncratic articulations, and unintelligible speech (coded as “UI”). The first author and research assistant then watched an example recording with an accompanying transcription. The research assistant then transcribed two practice probes not used for overall reliability and the first author conducted a reliability check using the procedure described below. These training probes were reviewed, and further training was providing that focused on specific and individual features of each participant’s speech (e.g., saying “dem” for “them”), language patterns (e.g., referring to themselves in the third person, perseveration), and expected content (e.g., names that regularly appeared in the narratives).

Subsequently, the research assistant independently transcribed 20% of randomly selected daily probes. Overall transcript reliability was 86% (range 81–94%) with no disagreements leading to possible coding differences. Overall transcript reliability for Lorcan was 94% (range 44–100%), Cormac 89% (78–100), Lily 88% (63–100%) and Siobhan 81% (49–100%). The four low reliability scores (i.e., below 80%) occurred due to one scorer scoring multiple words as unintelligible but the other scorer interpreting them. The vast majority of disagreements were non-content related words (e.g., “an” versus “and”).

Table 4 Generalization Probe Conditions

Generalization probe type				
	I	II	III	IV
Setting	Classroom, whole class on mat	1:1 classroom	At front of class	Home
Timing	Before any probes or intervention had occurred that week	After at least one probe/intervention session for week	After weekly probes/intervention finished for the week	Weekend
Partner	First author	Class teacher	Class teacher	Parents
Volunteer/requested	Volunteer	Requested	Requested	Requested
Stimuli	Request for any student to talk about their weekend, no photograph	"Tell me about your weekend," no photograph	"Tell me about your weekend," weekly probe photograph sent from home	"Tell me what you did at school," previously unseen photograph of school activity

### Coding Reliability

The second and third authors were trained in coding of the transcripts. Training involved discussion of macrostructure elements as set out in Table 3, then scorers independently coded four scripts not used for reliability. The same 20% of probes used for transcript reliability were then independently scored by the second or third authors for coding reliability. Similarly, the total number of agreed accuracy components was divided by the total number of possible components and multiplied by 100.

Overall reliability for the presence of macrostructure elements was 92% (range 86–100%) and for accuracy was 97% (91–100%). See Table 5 for coding reliability results for each participant and each macrostructure component. The occasional low reliability score was generally attributed to how particular information should be coded (e.g., one coder attributed information as “what” the other as “where”). Given that the total score out of 8 was used as the dependent variable, Pearson correlations were calculated between the raters. The correlation was .88 in the no-icons condition and .96 in the icons condition.

### Procedural Reliability

A research assistant conducted a procedural reliability check on 20% of randomly selected intervention sessions conducted by the first author. Each step was scored as either correctly or incorrectly completed. Omitted steps were scored as errors. Steps that were optional, for example error correction, were coded as not applicable and not included in calculations. The overall mean procedural reliability was 96% (range 76–100%), for Lily mean procedural reliability was 97% (range 94–100%), for Siobhan 98% (range 97–98%), Cormac 97% (range 94–99%), and for Lorcan 95% (range 76–100%). Steps in procedural reliability marked as incorrect were minor variations in wording in the vast majority of instances. The first author conducted procedural

**Table 5** Coding reliability results

	Presence—mean reliability % (range %)	Accuracy—mean reliability % (range %)
Participant		
Lily	90 (50–100)	100
Lorcan	98 (75–100)	98 (75–100)
Cormac	86 (50–100)	100
Siobhan	95 (50–100)	91 (75–100)
Macrostructure component		
Where	96 (84–100)	100
Who with	96 (89–100)	96 (84–100)
What	86 (82–89)	96 (96–100)
Feelings	97 (94–100)	97 (94–100)

reliability on 20% of the classroom teacher's intervention sessions. The overall mean procedural reliability was 99% (range 97–100%).

### Social Validity

For the first measure of social validity, an independent observer watched de-identified recordings of four pairs of videos of narratives (one pair from each participant) and was asked to select the better narrative. For each pair, one probe narrative from before intervention and one from after an intervention effect was observed were randomly selected. No information regarding what constituted a better narrative was provided. Narratives were presented to the observer with the pre-intervention probe first on 50% of occasions. For the second measure of social validity, the parents were emailed a survey and asked to respond to seven statements about their perceptions of narrative and the ease of preparing the weekly narratives.

### Results

Figure 1 shows the effects of oral narrative intervention on the macrostructure of personal narratives for each participant in the no-icons condition. Figure 2 shows the effect of oral narrative intervention on the macrostructure of personal narrative for each participant in the icons condition.

Lily received 31 intervention sessions and approximately 69 min of intervention. Intervention sessions ranged between 1 min 20 s and 3 min. Lily's intervention included phase I, the standard first phase of intervention received by all four participants, and phases II and III, the planned structured fading of icons. She was the only participant who received the preplanned phase II and III fading of icons. A rapid and clear intervention effect is displayed in both conditions. In the no-icons condition (Fig. 1), she had a stable baseline and there was an immediate improvement after the introduction of intervention phase I which continued into phases II and III. In the icons condition (Fig. 2), her baseline was reasonably stable and after intervention her performance immediately increased and she then achieved maximum scores.

Lorcan received 40 intervention sessions and approximately 107 min of intervention. Sessions ranged between 1 and 6 min. A clear intervention effect cannot be claimed for Lorcan as seven phase changes (phases I–VII, see Table 3) were implemented. His scores briefly increased above baseline in both conditions during phase I. During phase I, however, his scores dropped to below his maximum performance in baseline and he scored 2 for all probes. After 29 intervention sessions, his scores stabilized at the maximum score of eight in both conditions.

Cormac received 21 intervention sessions and approximately 94 min of intervention. He received phase I of the intervention and a unique variation of the intervention in phase II. Intervention sessions ranged between 1 min 36 s and 7 min 35 s. He performed at baseline level in both conditions in phase I of the intervention, scoring between 2 and 4. His scores increased in both conditions after the introduction of the variation of the intervention in phase II and his scores stabilized between 6 and 8.

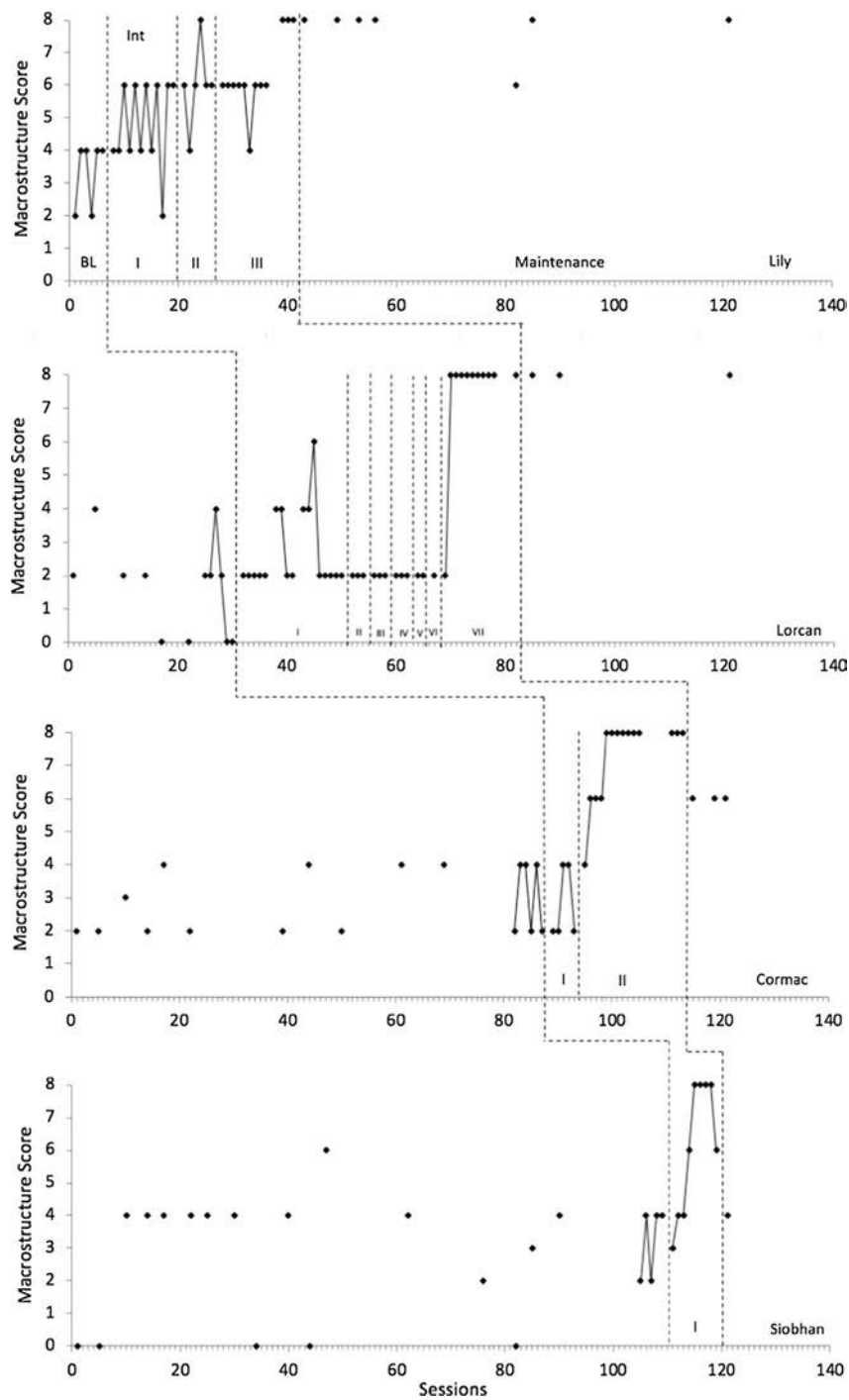


Fig. 1 Macrostructure score in no-icons condition. BL baseline; Int intervention

 Springer

Thus, an intervention effect using a variation of the intervention is evident for Cormac in both conditions.

Siobhan received 11 intervention sessions and approximately 33 min of intervention. Sessions ranged between 2 min and 44 s and 5 min. Baseline was somewhat variable but her “true” baseline immediately before intervention was stable at between 1 and 4 in the no-icons condition and at 4 in the icons condition. She received phase I of the intervention. After phase I was implemented Siobhan’s scores in the no-icons condition (Fig. 1) gradually increased over 5 sessions to the maximum score of 8 where she achieved some stability. Her scores in the icons condition (Fig. 2) increased to 8 immediately after phase I of the intervention was introduced, and she scored between 6 and 8 for all probes. She did not receive the pre-planned fading of icons (phases II, III) as her scores increased in both conditions. A clear intervention effect is present for Siobhan in both conditions.

Maintenance of the skill was demonstrated for Lily and Cormac, and Lorcan demonstrated a higher level of performance in the maintenance phase. Siobhan’s maintenance probes were mixed, scoring 4 in the no-icons condition and 8 in the icons condition. Participants’ scores in all generalization probes in both baseline, and intervention are presented in Table 6.

No data were collected for Lily in the baseline phase for generalization probe type II and III as she was the first participant and it was logistically difficult to coordinate collection with classroom activities. No data were recorded for Lorcan in generalization probe I, as he did not volunteer at any stage. Overall generalization probe data were variable. There is some evidence for improved performance for Lily in probe I, and for Cormac across all four probes. Although Lorcan’s scores did improve in probes II and III, it was only after several changes to the intervention.

The first measure of social validity was assessed by asking an independent observer to nominate the better narrative for each participant from two randomly selected pre- and post-narratives. The observer selected the post-intervention narrative as being the better narrative in 100% of opportunities. The second measure of

**Table 6** Generalization Probe Results

	I	II	III	IV
Lily				
Baseline	2, 3			6
Intervention	2, 4, 2, 4, 6	6, 6, 4, 8, 8	6, 6, 6, 6, 4	8, 8, 8
Lorcan				
Baseline		2, 2	0	2
Intervention		2, 8	8, 8	
Cormac				
Baseline	2, 0	4, 4	2, 6	2
Intervention	6	8	8	8
Siobhan				
Baseline	4, 2, 2, 4, 3	4, 2	4	4, 4, 2
Intervention	4	4	2	8

social validity was a Likert-scale parent survey where 1 is strongly disagree and 5 is strongly agree. All four families completed the survey and answered all questions. Mean responses and range of responses to each statement are as follows: perceived overall importance of children being able to give a personal narrative 5; their child generates better narratives after the intervention 4.5 (range 4–5); they feel better able to help their child generate a narrative after the intervention 4 (3–5); it was easy to find two weekly activities 3.5 (3–5); it was easy to take the photographs 4 (3–5); it was easy to email the photographs 3.75(3–4); and they didn't mind preparing the weekly narratives 4 (4).

## Discussion

The purpose of this study was to examine the effects of an oral narrative intervention on the personal narratives of four children with ASD and severe language disorder. This study extends the Favot et al. pilot study (2018b) and other previous research on oral narrative intervention in children with ASD (Favot et al. 2018a; Gillam et al. 2015; Petersen et al. 2014) as a strong experimental effect was demonstrated for three of the four participants requiring variations of the intervention and maintenance was demonstrated for two participants. One participant showed improvements across all four generalization probes, and Lily showed some evidence of improvement in the “whole class on the mat” probe. The results of this study are consistent with previous studies that have used icons, pictures to represent each narrative, modeling, and the participant telling an entire narrative each session (Favot et al. 2018a; Gillam et al. 2015; Petersen et al. 2014). In keeping with Favot et al. (2018b), the intervention was brief, with participants receiving between 33 and 107 min of intervention.

A single participant in Favot's (2018b) pilot study perseverated on the “where” element of his narratives and was using the same location to begin his narrative regardless of where it actually was. Based on the perseveration in the pilot study, we introduced an antecedent in an attempt to ensure participants in the current study were provided opportunities to practise narratives in a range of settings. Lorcan, however, presented with a different perseveration. Early in the intervention he perseverated on the “what” element in both probes and in the intervention at the “say the whole narrative” step. A number of changes were implemented, and this perseveration was overcome after more intervention narratives were provided and more opportunities to practice each narrative, and the perseveration was interrupted. There is evidence that increasing opportunities to respond results in higher task engagement and academic achievement (Sutherland and Wehby 2001) and that behavioral teaching strategies such as interruption and redirection can reduce the occurrence of some types of repetitive behaviors in children with ASD (Boyd et al. 2012).

Increased opportunities to practise each intervention narrative were also a successful variation to the intervention for Cormac. Favot et al. (2018b) suggested that two or three intervention narratives per session may be of sufficient intensity to create an intervention effect, but this level of intensity did not appear to be sufficient for either Lorcan or Cormac who required up to four different intervention narratives



per session with up to three opportunities to produce the whole narrative. These individual responses can be challenging for practitioners and highlight the benefits of single case research designs with this population.

Narrative discourse occurs naturally in different environments (Schoenbrodt et al. 2010) and although children may be capable of producing one kind of structure with one set of stimuli, they may not produce a narrative at that level of complexity under all circumstances (Hedberg and Westby 1993). Generalization from intervention contexts to natural contexts should therefore be a critical component of intervention for personal narratives. The four types of generalization probes in the current study were designed to provide participants with opportunities to share narratives in different settings within the school and at home, with different people, and in response to different stimuli. Generalization probe “whole class on mat” is a typical mainstream classroom activity and perhaps placed the most demands on the participants. Despite the demands, two participants showed improvements in this condition indicating a possible increased functional use of the response learned in the intervention.

Improvements did occur for three participants in the generalization to either the whole class, a teacher, or parents. This is in contrast to findings from Favot et al. (2018b), suggesting that individuals with ASD and severe language disorder can generalize skills learned with the interventionist to other people. In interpreting generalization data in the present study, it should be remembered that generalization probes involved photographs that had not been used in intervention.

Procedural reliability for the classroom teacher implementing the intervention was high, indicating that teachers could be taught to use with a high degree of fidelity. Thus, the current study provides some evidence supporting the feasibility of classroom teachers conducting the intervention.

Social validity data measure the social and clinical importance of the treatment and changes affected by the treatment (Carter 2010; Foster and Mash 1999). A blind independent observer objectively rated the post-intervention personal narratives as being the better narrative for all participants, indicating a clinically and socially meaningful improvement in narrative skills. The mean responses from the parent survey indicate a parental perception of improvement in narrative skills and that despite the demands placed on the parents to produce and send weekly narratives, they found it was generally easy to do.

Some limitations in the present study should be noted. Although the range and number of generalization data points were more extensive than has been collected in previous studies and some improvements can be observed, generalization data were limited. Another limitation to the study was the delivery of the intervention by the first author. Attempts were made to incorporate a classroom teacher into the service delivery, and Lily did receive nine intervention sessions from the class teacher. Demands of the classroom, however, and the number of phase changes made to break Lorcan’s perseveration, meant that it was not always possible for the class teacher to deliver the intervention.

Researchers could investigate the efficacy of small group intervention, similar to the individual intervention described here, within the classroom. Such a group intervention may be more practical in a classroom setting. Given the short semi-scripted

style of the intervention, future research could also incorporate classroom teachers delivering the intervention. Given the issues with conducting regular generalization probes in the present study and the variable results, further examination of generalization should be considered in future research. Future research could also include a range of preplanned strategies in the intervention procedure that addressed perseveration.

The effects of an oral narrative intervention on the personal narratives of participants with ASD and severe language disorder are described in this paper. Experimental control was demonstrated for three of the four participants although individualized modifications of the instructional procedure were needed for two participants. The acquired skills were maintained for two participants and evidence for generalization was limited. The intervention was promising, but further research is needed including investigation of the effectiveness of group delivery and further examination of generalization.

**Author Contribution** All authors have contributed to, seen and approved of the manuscript and agree to the order of the authors as listed on the title page.

**Funding** This study did not receive any funding.

### Compliance with Ethical Standards

**Conflict of interest** All the authors declare that they have no conflict of interest.

**Ethical approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

**Informed consent** Informed consent was obtained from all individual participants included in the study.

### References

- Allen, M. S., Kertoy, M. K., Sherblom, J. C., & Pettit, J. M. (1994). Children's narrative productions: A comparison of personal event and fictional stories. *Applied Psycholinguistics*, *15*, 149–176. <https://doi.org/10.1017/S0142716400005300>.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Baixauli, I., Colomer, C., Roselló, B., & Miranda, A. (2016). Narratives of children with high-functioning autism spectrum disorder: A meta-analysis. *Research in Developmental Disabilities*, *59*, 234–254. <https://doi.org/10.1016/j.ridd.2016.09.007>.
- Bang, J., Burns, J., & Nadig, A. (2013). Brief report: Conveying subjective experience in conversation: Production of mental state terms and personal narratives in individuals with high functioning autism. *Journal of Autism and Developmental Disorders*, *43*, 1732–1740. <https://doi.org/10.1007/s10803-012-1716-4>.
- Banney, R. M., Harper-Hill, K., & Arnott, W. L. (2015). The Autism Diagnostic Observation Schedule and narrative assessment: Evidence for specific narrative impairments in autism spectrum disorders. *International Journal of Speech—Language Pathology*, *17*, 159–171. <https://doi.org/10.3109/17549507.2014.977348>.

- Bishop, D. V. (2003). *Test for reception of grammar: Second edition (TROG-2) [Assessment instrument]*. London: Pearson Assessment.
- Bishop, D. V. M., & Edmundson, A. (1987). Language-impaired 4-year-olds distinguishing transient from persistent impairment. *Journal of Speech and Hearing Disorders*, 52, 156–173. <https://doi.org/10.1044/jshd.5202.156>.
- Boardmaker® (Version 6) [Computer software]. (2008). Solana Beach, CA: Mayer-Johnson.
- Boudreau, D. M., & Chapman, R. S. (2000). The relationship between event representation and linguistic skill in narratives of children and adolescents with Down syndrome. *Journal of Speech, Language, and Hearing Research*, 43, 1146–1159. <https://doi.org/10.1044/jslhr.4305.1146>.
- Boyd, B. A., McDonough, S. G., & Bodfish, J. W. (2012). Evidence-based behavioral interventions for repetitive behaviors in autism. *Journal of Autism and Developmental Disorders*, 42, 1236–1248. <https://doi.org/10.1007/s10803-011-1284-z>.
- Brown, J. A., Garzarek, J. E., & Donegan, K. L. (2014). Effects of a narrative intervention on story retelling in at-risk young children. *Topics in Early Childhood Special Education*, 34, 154–164. <https://doi.org/10.1177/0271121414536447>.
- Brown, B. T., Morris, G., Nida, R. E., & Baker-Ward, L. (2012). Brief report: Making experience personal: Internal states language in the memory narratives of children with and without Asperger's disorder. *Journal of Autism and Developmental Disorders*, 42, 441–446. <https://doi.org/10.1007/s10803-011-1246-5>.
- Carter, S. (2010). *The social validity manual: A guide to subjective evaluation of behavior interventions*. Amsterdam: Academic Press.
- Cheshire, J. (2000). The telling or the tale? Narratives and gender in adolescent friendship networks. *Journal of Sociolinguistics*, 4, 234–262. <https://doi.org/10.1111/1467-9481.00113>.
- Colozzo, P., Gillam, R. B., Wood, M., Schnell, R. D., & Johnston, J. R. (2011). Content and form in the narratives of children with specific language impairment. *Journal of Speech Language and Hearing Research*, 54, 1609–1627. [https://doi.org/10.1044/1092-4388\(2011/10-0247](https://doi.org/10.1044/1092-4388(2011/10-0247).
- Colozzo, P., Morris, H., & Mirenda, P. (2015). Narrative production in children with autism spectrum disorder and specific language impairment. *Canadian Journal of Speech Language Pathology and Audiology*, 39, 316–332.
- Dunn, L. M., & Dunn, D. M. (2007). *Peabody Picture Vocabulary Test: Fourth Edition (PPVT-4) [Assessment Instrument]*. Minneapolis, MN: Pearson Assessments.
- Eisenberg, A. R. (1985). Learning to describe past experiences in conversation. *Discourse Processes*, 8, 177–204. <https://doi.org/10.1080/01638538509544613>.
- Favot, K., Carter, M., & Stephenson, J. (2018a). The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study. *Journal of Developmental and Physical Disabilities*, 30, 615–637. <https://doi.org/10.1007/s10882-018-9608-y>.
- Favot, K., Carter, M., & Stephenson, J. (2018b). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language impairment: A pilot study. *International Journal of Disability, Development and Education*. <https://doi.org/10.1080/1034912x.2018.1453049>.
- Finestack, L. H. (2012). Five principles to consider when providing narrative language intervention to children and adolescents with developmental disabilities. *Perspectives on Language Learning and Education*, 19, 147–154. <https://doi.org/10.1044/1le19.4.147>.
- Foster, S. L., & Mash, E. J. (1999). Assessing social validity in clinical treatment research: Issues and procedures. *Journal of Consulting and Clinical Psychology*, 67(3), 308.
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech Language and Hearing Research*, 58, 920–933. [https://doi.org/10.1044/2015\\_JSLHR-L-14-0295](https://doi.org/10.1044/2015_JSLHR-L-14-0295).
- Gillam, R. B., & Pearson, N. A. (2017). *Test of Narrative Language: Second Edition (TNL-2) [Assessment Instrument]*. Austin, TX: Pro- ed.
- Green, L. B., & Klecan-Aker, J. S. (2012). Teaching story grammar components to increase oral narrative ability: A group intervention study. *Child Language Teaching and Therapy*, 28, 263–276. <https://doi.org/10.1177/0265659012456029>.
- Harrison, P., & Oakland, T. (2015). *Adaptive Behavior Assessment System: Third Edition (ABAS-III) [Assessment Instrument]*. Torrance, CA: Western Psychological Services.
- Hedberg, N. L., & Westby, C. E. (1993). *Analyzing storytelling skills: Theory to practice*. Tuscon, AZ: The Psychological Corporation.

- Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. *Journal of Applied Behavior Analysis*, 11, 189–196.
- Hudson, J., & Shapiro, L. (1991). From knowing to telling: The development of children's scripts, stories and personal narrative. In A. McCabe & C. Peterson (Eds.), *Developing narrative structure* (pp. 89–136). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Hughes, D. L., McGillivray, L., & Schmidek, M. (1997). *Guide to narrative language: Procedures for assessment*. Eau Claire, WI: Thinking Publications.
- King, D., Dockrell, J. E., & Stuart, M. (2013). Event narratives in 11–14 year olds with autistic spectrum disorder. *International Journal of Language and Communication Disorders*, 48, 522–533. <https://doi.org/10.1111/1460-6984.12025>.
- Lahey, M. (1988). *Language disorders and language development*. New York, NY: Collier Macmillan.
- Losh, M., & Capps, L. (2003). Narrative ability in high-functioning children with autism or Asperger's syndrome. *Journal of Autism and Developmental Disorders*, 33, 239–251. <https://doi.org/10.1023/A:1024446215446>.
- Loveland, K. A., McEvoy, R. E., Tunali, B., & Kelley, M. L. (1990). Narrative story telling in autism and Down's syndrome. *British Journal of Developmental Psychology*, 8, 9–23. <https://doi.org/10.1111/j.2044-835X.1990.tb00818.x>.
- McCabe, A., Bliss, L., Barra, G., & Bennett, M. (2008). Comparison of personal versus fictional narratives of children with language impairment. *American Journal of Speech-Language Pathology*, 17, 194–206. [https://doi.org/10.1044/1058-0360\(2008/019\)](https://doi.org/10.1044/1058-0360(2008/019)).
- McCabe, A., & Rollins, P. R. (1994). Assessment of preschool narrative skills. *American Journal of Speech-Language Pathology*, 3(1), 45–56.
- Mills, B. D., Lai, J., Brown, T. T., Erhart, M., Halgren, E., Reilly, J., et al. (2013). White matter microstructure correlates of narrative production in typically developing children and children with high functioning autism. *Neuropsychologia*, 51, 1933–1941. <https://doi.org/10.1016/j.neuropsychologia.2013.06.012>.
- Morrow, L. M. (1985). Retelling stories: A strategy for improving young children's comprehension, concept of story structure, and oral language complexity. *The Elementary School Journal*, 85, 647–661. <https://doi.org/10.1086/461427>.
- Nathanson, R., Crank, J. N., Saywitz, K. J., & Ruegg, E. (2007). Enhancing the oral narratives of children with learning disabilities. *Reading & Writing Quarterly*, 2, 315–331. <https://doi.org/10.1080/10573560701501610>.
- Pakulski, L. A., & Kaderavek, J. N. (2012). Reading intervention to improve narrative production, narrative comprehension, and motivation and interest of children with hearing loss. *Volta Review*, 112, 87–112.
- Petersen, D. B. (2011). A systematic review of narrative-based language intervention with children who have language impairment. *Communication Disorders Quarterly*, 32, 207–220. <https://doi.org/10.1177/1525740109353937>.
- Petersen, D. B., Brown, C. L., Ukrainetz, T. A., Wise, C., Spencer, T. D., & Zebre, J. (2014). Systematic individualized narrative language intervention on the personal narratives of children with autism. *Language, Speech, and Hearing Services in Schools*, 45, 67–86. [https://doi.org/10.1044/2013\\_LSHSS-12-0099](https://doi.org/10.1044/2013_LSHSS-12-0099).
- Peterson, C., Jesso, B., & McCabe, A. (1999). Encouraging narratives in preschoolers: An intervention study. *Journal of Child Language*, 26, 49–67. <https://doi.org/10.1017/S0305000998003651>.
- Peterson, C., & McCabe, A. (1991). Linking children's connective use and narrative macrostructure. In C. Peterson & A. McCabe (Eds.), *Developing narrative structure* (pp. 29–54). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Preece, A. (1987). The range of narrative forms conversationally produced by young children. *Journal of Child Language*, 14, 353–373. <https://doi.org/10.1017/S0305000900012976>.
- Reese, E., & Newcombe, R. (2007). Training mothers in elaborative reminiscing enhances children's autobiographical memory and narrative. *Child Development*, 78, 1153–1170. <https://doi.org/10.1111/j.1467-8624.2007.01058.x>.
- Rixon, E., & Jaeger, S. (2011). Narrative therapy: A whole—school approach within a specialist residential school for young people on the autism spectrum. *Good Autism Practice*, 12, 64–74.
- Roid, G. (2003). *Stanford-Binet Intelligence Scales: Fifth Edition (SB-5) [Assessment Instrument]*. Itasca, IL: Riverside Publishing.

- Schoenbrodt, L., Kerins, M., & Gesell, J. (2010). Using narrative language intervention as a tool to increase communicative competence in Spanish-speaking children. *Language, Culture and Curriculum*, 16, 48–59. <https://doi.org/10.1080/07908310308666656>.
- Schopler, E., Van Bourgondien, M. E., & Love, S. R. (2010). *Childhood Autism Rating Scale, Second Edition (CARS-2) [Assessment Instrument]*. Los Angeles, CA: Western Psychological Services.
- Shiro, M. (2003). Genre and evaluation in narrative development. *Journal of Child Language*, 30, 165–195. <https://doi.org/10.1017/S0305000902005500>.
- Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (2005). *Vineland Adaptive Behavior Scales: Second Edition (Vineland-II) [Assessment Instrument]*. Circle Pines, MN: AGS Publishing.
- Spencer, T. D., & Petersen, D. B. (2018). Bridging oral and written language: An oral narrative language intervention study with writing outcomes. *Language Speech and Hearing Services in Schools*, in press. [https://doi.org/10.1044/2018\\_lshss-17-0030](https://doi.org/10.1044/2018_lshss-17-0030).
- Sperry, L. L., & Sperry, D. E. (1996). Early development of narrative skills. *Cognitive Development*, 11, 443–465. [https://doi.org/10.1016/S0885-2014\(96\)90013-1](https://doi.org/10.1016/S0885-2014(96)90013-1).
- Sutherland, K. S., & Wehby, J. H. (2001). Exploring the relationship between increased opportunities to respond to academic requests and the academic and behavioral outcomes of students with EBD. *Remedial and Special Education*, 22, 113–121.
- Wechsler, D. (2012). *Wechsler Preschool and Primary Scale of Intelligence: Fourth Edition (WPPSI-IV) [Assessment Instrument]*. San Antonio, TX: Psychological Corporation.
- Wiig, E. H., Secord, W. A., & Semel, E. (2017). *Clinical Evaluation of Language Fundamentals: Fifth Edition, Australian and New Zealand Standardised Edition (CELF-5 A&NZ) [Assessment Instrument]*. Sydney: Pearson Clinical Assessment.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

## Appendix A

### Participant description

Name	Age (years; months)	Diagnosis	Adaptive behavior	IQ	CELF-5		TROG-2	PPVT-4	CARS 2	Personal narrative screeners – macrostructure elements included	
					Receptive	Expressive				Weekend	School activity
Lily	6;6	ASD (DSM-5)	Extremely low (ABAS-II)		SS 67 Severe disorder	SS 55 Severe disorder		SS 75 2nd percentile moderately low	Minimal to no symptoms	None	What
Lorcan	7;7	ASD (DSM-5)		Verbal IQ mild delay (SB-5)		SS 47 Severe disorder	SS 55 Below 1 <sup>st</sup> percentile	SS 66 1 <sup>st</sup> percentile extremely low	Severe	None	What
Cormac	6;10	Autism spectrum range (CARS- 2)	Mild impairment (Vineland- II)	Full scale mild impairment Verbal IQ borderline (SB-5)	SS 61 Severe disorder	SS 52 Severe disorder		SS 76 percentile moderately low	Mild to moderate symptoms	None	None
Siobhan	6;5	ASD (DSM-5)	Below average (ABAS-3)	Fluid reasoning 4th <sup>th</sup> percentile, non verbal borderline (WPPSI-IV)	SS 67 Severe disorder	SS 57 Severe disorder		SS 68 1st percentile extremely low	Mild to moderate symptoms	None	Who with

*Note.* DSM-5 = Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013); CARS-2 = Childhood Autism Rating Scales, Second Edition (Schopler, Van Bourgondien, & Love, 2010); ABAS-II = Adaptive Behavior Assessment System, Second Edition (Harrison & Oakland, 2015); ABAS-3 = Adaptive Behavior Assessment System, Third Edition (Harrison & Oakland, 2015); Vineland-II – Vineland Adaptive Behavior Scales, Second Edition (Sparrow, Balla, & Cicchetti, 2005); SB-5 = Stanford-Binet Intelligence Scale, Fifth Edition (Roid, 2003); WPPSI-IV = Wechsler Preschool and Primary Sc

## **Chapter 4: The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study**

### **Chapter Overview**

This chapter is a paper “The effects of an oral narrative intervention on the fictional narrative retells of children with autism spectrum disorder and severe language impairment: A pilot study”, published in the *Journal of Developmental and Physical Disabilities* (Favot, Carter, & Stephenson, 2018). A multiple baseline with probe design was used to examine the effects of intervention on specific macrostructural features (*who*, *setting (what + where)*, *problem*, *internal response (feelings)*, *attempt at a resolution (do)*, *consequence (next)*, and *end* of fictional narrative retell in four participants aged between 6 and 9 years of age. An intervention and maintenance effect was demonstrated for three participants but generalisation to storybooks typically used in the classroom did not occur. This is the first study to provide an investigation into the effects of intervention on fictional narrative retells on children with ASD and severe language disorder.

### **Publication Status**

Favot, K., Carter, M., & Stephenson, J. (2018). The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study. *Journal of Developmental and Physical Disabilities*, 30, 615-637. doi:10.1007/s10882-018-9608-y

## The Effects of an Oral Narrative Intervention on the Fictional Narrative Retells of Children with ASD and Severe Language Impairment: A Pilot Study

Kate Favot<sup>1</sup> · Mark Carter<sup>1</sup> · Jennifer Stephenson<sup>1</sup>

Published online: 8 June 2018

© Springer Science+Business Media, LLC, part of Springer Nature 2018

**Abstract** A multiple baseline across participants design was used in this pilot study to investigate the effect of an oral narrative intervention on the macrostructure of short fictional narrative retells in children with a diagnosis of autism spectrum disorder (ASD) and severe communication impairment. Four children aged between 6 and 9 years of age took part in the 1:1 intervention that targeted the narrative macrostructure elements of character (who), setting (where+what), problem, internal response (feelings), attempt at a resolution (do), consequence (next) and end. Intervention involved the use of macrostructure icons, modeling, and participants telling the entire narrative each session. An intervention and maintenance effect was demonstrated for three participants using untaught stories but generalization to storybooks typical of classroom use did not occur. In addition, social validity measures indicated that naive observers rated retells as better following intervention. Areas for future research include investigation of generalization to more complex stories, and implementation of the intervention with small groups.

**Keywords** Fictional narrative retell · Fictional narrative intervention · Children · Language impairment · Autism spectrum disorder

---

✉ Kate Favot  
kate.favot@mq.edu.au

Mark Carter  
mark.carter@mq.edu.au

Jennifer Stephenson  
jennifer.stephenson@mq.edu.au

<sup>1</sup> Macquarie University Special Education Centre, Macquarie University, Sydney, NSW 2109, Australia



## Introduction

Narratives relate to personally experienced or fictional events (McCabe 1991). From an early age they represent a large part of discourse (McCabe et al. 2008) and have been linked with success in peer relationships (Bloome et al. 2003), daily interactions (McCabe et al. 2008), development of personal identity (Bloome et al. 2003) and school achievement (Bishop and Edmundson 1987; Hughes et al. 1997; Kaderavek and Sulzby 2000). Narratives have been called a bridge between oral language and literacy (Westby 1991) as they provide a structure for organizing abstract thought through sequencing, and a structure for the development of literate language, (Petersen 2011) (e.g., conjunctions, elaborated noun phrases, mental verbs and adverbs) (Greenhalgh and Strong 2001). Skills with both personal and fictional narratives have been associated with skills in reading (Wellman et al. 2011), reading comprehension (Dimino et al. 1995), written language (Kaderavek 2015; McCabe et al. 2008), and classroom discussion (Nathanson et al. 2007). Crucially, narrative is also a major tool for teacher evaluation of student knowledge (Bloome et al. 2003; Petersen and Spencer 2010a).

The mainstream western academic culture places a high value on narratives that adhere to a set macrostructure (story grammar) organization (Bliss and McCabe 2008; Brown et al. 2014; Petersen et al. 2010). Macrostructure is the content and organization of a story (Finestack 2012) and represents a means of making sense of narratives (McCabe 1991).

Specific microstructural features, (e.g., total number of words, number of different words, coordinating conjunctions, subordinating conjunctions, past tense) may enhance narrative macrostructure quality (Segal and Duchan 1997) and clarify meaning (Eisenberg et al. 2008; Spencer et al. 2013). Macrostructure elements however are considered core to fictional narratives (Peterson and McCabe 1991) and include setting (incorporating character), initiating event, internal response or feelings, plan, attempt at a resolution and an end (Stein and Glenn 1978). See appendices for general and specific examples of macrostructure elements.

## Narrative Retell

Narrative retells require individuals to listen to or read a story and then retell it in their own words (Kalmbach 1986). A narrative retell is not an attempt at verbatim recall but rather an attempt to communicate understanding by selecting, organizing and emphasizing parts of the narrative while ignoring others (Kalmbach 1980). The ability to retell a fictional narrative, using macrostructural elements, is an important skill for literacy development (Dimino et al. 1995) as proficiency with narrative retells assists individuals to comprehend narrative structure and the main idea, while simultaneously facilitating oral language development (Rog 2003). Narrative retell may provide a bridge to original narratives, as individuals are required to identify, comprehend and reproduce the narrative structure for an existing story, without the additional cognitive demands of original narrative generation.

## Narrative and ASD

Autism spectrum disorder (ASD) is a developmental disorder characterized by impairments in social interaction and social communication and restrictive and repetitive

patterns of behavior (American Psychiatric Association 2013). Narratives are one of the most socially motivated areas of language (Eigsti et al. 2011) and children with ASD have been found to have difficulties with narratives, even when they do not have diagnosed language impairment (Baixauli et al. 2016). Baixauli et al. (2016) conducted a meta analysis of 24 studies in which researchers investigated the oral narrative production skills in individuals with ASD but no language or intellectual impairment. They concluded that individuals with ASD performed significantly worse than peers in both macrostructural and microstructural domains. Specifically, they concluded that individuals with ASD may produce narratives that have impaired story structure (Barnes and Baron-Cohen 2012); include fewer causal relations and fewer mental state verbs (Barnes and Baron-Cohen 2012; Baron-Cohen et al. 1986) and that they may be shorter, less descriptive and less grammatically complex (Tager-Flusberg 1995; King et al. 2013). Such difficulties are likely to be substantially compounded in individuals with language impairments.

There is limited research into the effect of oral narrative intervention on the oral narratives of children with ASD. Researchers in three studies have investigated the effects of oral narrative intervention on the narratives of children with ASD (Favot et al. 2018; Gillam et al. 2015; Petersen et al. 2014) and found that explicit oral narrative intervention may be an effective strategy. Participants in the studies were required to generate personal narratives (Favot et al. 2018; Petersen et al. 2014) and original fictional narratives (Gillam et al. 2015) but narrative retells have not been examined to date. Favot et al. (2018) used a single macrostructure score combined from the elements of *where*, *who with*, *what* and *feelings* to measure the efficacy of an oral narrative intervention. Gillam et al. (2015) measured narrative growth using three different scales, two made from combined scores of macrostructure and microstructure and one using a combined score of five of the seven macrostructure elements taught in the intervention program. Petersen et al. (2014) measured growth across individually targeted single elements of macrostructure and microstructure. Gillam et al. (2015) included two participants with mild language impairment and 2 with moderate to severe language impairment. All three participants in Favot et al. (2018) had diagnosed language impairment according to a battery of standardized language assessments. All three participants in Petersen's study (2014) were described as having language impairment based on parent and teacher reports, and narrative retell skills significantly below developmental expectations, using the Test of Narrative Retell (Petersen and Spencer 2010b). Only one study included participants with documented low verbal IQ (Favot et al. 2018). Common intervention components of these studies included, using icons to represent macrostructure elements, pictures to represent individual narratives, clinician modeling of narratives and requiring students to say an entire narrative each intervention session.

Given the links between narrative success and academic success, the problems that children with ASD experience with narrative retell and the paucity of research in the area further research to extend the existing research is warranted. The purpose of this study is to investigate the effect of an oral narrative intervention on the macrostructure of fictional narrative retells of children with ASD and severe language impairments. Given there is no research currently available on teaching this type of narrative to children with ASD and severe language impairment, the pilot study was also intended to

provide information on measurement issues, problems related to the intervention and any adjustments that might be required. The specific research questions were:

1. Does oral narrative intervention have an effect on the macrostructure of fictional narrative retells produced by school-aged children with ASD and severe language impairment?
2. Do improvements in the macrostructure of fictional narrative retells produced by school aged children with ASD and severe language impairment maintain after intervention has been withdrawn?
3. Do improvements in the macrostructure of fictional narrative retells produced by school aged children with ASD and severe language impairment generalize to storybooks typical of classroom use?

## Method

### Participants

Two girls and two boys were selected to participate in the intervention study. All four participants attended the university based special education program where the intervention took place. The university research ethics committee approved the intervention. Participants attended the program Monday to Friday and received instruction in a broad educational program with a focus on literacy and numeracy. Participants were eligible for the study if they (a) had a diagnosis of ASD from a pediatrician or psychologist, (b) had a receptive and expressive language impairment according to results from a standardized language assessment, (c) had English as their home language, (d) had speech intelligible to non-familiar listeners as judged by the researchers, (e) were able to sit at a desk and participate in a structured class activity for 10 to 15 min, as reported by the classroom teachers and (f), did not include all of the following macrostructure elements in their fictional narrative retells, *who*, *what + where*, *problem*, *feelings* about problem, what did the person in the story *do* to fix the problem, what happened *next*, and the *end*.

The first author, also the school speech and language pathologist conducted language assessments using the Clinical Evaluation of Language Fundamentals, 4th Ed, Australian and New Zealand Standardized Edition (Semel et al. 2006), and the Peabody Picture Vocabulary Test, 4th Ed (Dunn and Dunn 2007). The final inclusion criterion was based on a screener fictional narrative retell that was collected from each participant prior to the research by asking each child to listen to a short narrative and then tell it back. The fictional narrative retells were collected in a quiet room with the participant sitting next to the first author. The participants' classroom teachers also completed the Childhood Autism Rating Scale, 2nd Ed (Schopler et al. 2010). The results of assessments are provided in Table 1. Not long after the intervention finished Zoe was diagnosed with absence seizures by a neurologist, but did not receive medication.

**Table 1** Participant description

Name	Age (years; months)	Diagnosis	Adaptive behavior	IQ	CELF-4 Receptive	A&NZ	CELF-4 Expressive	A&NZ	PPVT-4	CARS-2	Macrostructure components in retell screener
Monica	6;9	Autistic disorder (DSM-IV-TR)	Extremely low (ABAS-II)	Verbal IQ 70 (WPPSI-III A&NZ)	SS 64 Severe impairment		SS 45 Severe impairment		SS 63 1st percentile extremely low	Minimal to no symptoms	<i>What</i> (from <i>What+Where</i> ) <i>Feelings</i>
Andre	9;2	Autistic disorder (DSM-IV-TR)	Mildly impaired (ABAS-II)	Verbal IQ below 1st percentile (WPPSI-III A&NZ)	SS 64 Severe impairment		SS 47 Severe impairment		SS 72 1st percentile extremely low	Mild to moderate symptoms	<i>Who</i> <i>What</i> (from <i>What+Where</i> )
Stephano	6;6	ASD (DSM-5)	Mild range of disability (Vineland-II)	Verbal IQ mild range of disability (WPPSI-IV)	SS 53 Severe impairment		SS 45 Severe impairment		SS 84 14th percentile moderately low	Mild to moderate symptoms	<i>Who</i>
Zoe	7;6	ASD (DSM-5)	Moderately impaired (ABAS-II)	Verbal IQ below 1st percentile (SB-5)	SS 64 Severe impairment		SS 45 Severe impairment		SS 75 5th percentile moderately low	Minimal to no symptoms	<i>Problem</i>

DSM-IV-TR = Diagnostic and statistical manual of mental disorders (American Psychiatric Association 2000); DSM-5 = Diagnostic and statistical manual of mental disorders (American Psychiatric Association 2013); ABAS-II = Adaptive Behavior Assessment System, Second Edition (Harrison and Oakland 2015); Vineland-II = Vineland Adaptive Behavior Scales, Second Edition (Sparrow et al. 2005); WPPSI-III A&NZ = Wechsler Preschool and Primary Scale of Intelligence, Third Edition Australian and New Zealand Standardized Edition (Wechsler 2004); WPPSI-IV = Wechsler Preschool and Primary Scale of Intelligence, Fourth Edition (Wechsler 2012); SB-5 = Stanford-Binet Intelligence Scale, Fifth Edition (Roid 2003); CELF-4 A&NZ = Clinical Evaluation of Language Fundamentals, Fourth Edition Australian and New Zealand Standardized Edition (Semel et al. 2006); PPVT-4 = Peabody Picture Vocabulary Test, Fourth Edition (Dunn and Dunn 2007); CARS-2 = Childhood Autism Rating Scales, Second Edition (Schopler et al. 2010); SS = standard score

## Experimental Design

A multiple baseline with probe across participants design was used to investigate the effects of a fictional narrative retell intervention on the participants' fictional narrative macrostructure. Children who may benefit from narrative intervention are a diverse group and may have complex and idiosyncratic problems and the diversity of needs and skills in children with ASD make it difficult to recruit the large samples needed for group designs. Multiple baseline across participant designs allow the researcher to investigate behaviors in individuals rather than groups. Experimental control is demonstrated in multiple baseline designs when the data illustrates experimental effect at three different points in time (Kratochwill et al. 2010; Kazdin 2011).

## Materials

The first author used a magnetic whiteboard (60 × 45 cm), icon cards (5 × 5 cm) representing each of the seven macrostructure elements, one probe narrative and one intervention narrative per session. The narratives were written by the first author based on narratives in The Test of Narrative Retell-Preschool (TNR-P) (Spencer and Petersen 2010). Each narrative was textually explicit as all the information needed to fully understand the text was given to the listener (Carnine et al. 2009). The narratives contained situations and problems that could likely be within the participants' experience (e.g., falling off a scooter). The 30 stories were written in the same format. They contained between 65 and 75 words and presented information pertaining to the seven macrostructure elements in the same order. Each narrative included the macrostructure elements of *who* (main character), *what + where* (what the main character was doing and where they were), *problem* (what went wrong), *feelings about the problem*, *do* (what the main character did to try and fix the problem), *next*, (what happened after the main character tried to fix the problem), and *end*. Picture Communication Symbols (Mayer-Johnson 2008) representing each of the macrostructure elements were used as icons (visual supports). After two intervention sessions with the first participant the data indicated that the original "where" macrostructure component and corresponding icon was not eliciting the expected information. Therefore the icon was altered for use in both probes and intervention to become "what + where". This was to explicitly incorporate the setting activity plus the location as used by Petersen and Spencer in the TNR-P (Spencer and Petersen 2010). This was then applied in both the icon probe conditions and intervention for all participants.

Each of the 30 narratives was assigned a number between one and 30. A random number generator ([www.random.org](http://www.random.org)) was used to select 10 numbers between one and 30, to be the probe narratives. Those 10 narratives were then renamed probe narrative 1–10. The remaining 20 narratives were used for intervention (intervention narratives 1–20).

## Dependent Variables

The dependent variable was the macrostructure of fictional narrative retells. Data were collected in both the no icon and the icon condition. The icon condition was included as it is a more sensitive measure of improvement and it was likely that progress would be

made in the icon condition before the no icon condition. The seven macrostructure elements used in this study are based on Stein and Glenn's (1978) macrostructure elements but were renamed to increase the transparency of meaning for the participants, given their level of language impairment. The macrostructure of fictional narrative retell was comprised of *who*, *what + where*, *problem*, *feelings about the problem*, *do*, *next* and *end*.

Responses of any length were acceptable. The responses for each component were not required to be linked grammatically or to be provided in a specific order. The first author awarded each of the seven macrostructure components a score of 0, 1 or 2 according to set criteria for each story and each retell was scored out of possible 14 points. The scoring criteria for each story followed the general scoring guidelines set out in the Test of Narrative Retell School Age: Examiner's Manual (Petersen and Spencer 2010a) but was adapted to suit the stimulus stories. Two points were awarded if all the relevant information was explicitly included. One point was awarded if only some relevant information was included or if the information was not specific. See Appendix 1 for definitions of each macrostructure component and general scoring guidelines. See Appendix 2 for an example story with specific scoring guidelines.

### Procedures

In baseline and probe conditions the participant sat next to the first author at a table in a small room next to their regular classroom. The whiteboard was on the table directly in front of the participant. An iPhone 4 was in an elevated position on the table and was used to video record each session.

### Baseline and Probes

Probes were collected weekly, if the participant was not yet receiving intervention or four times a week if they were in true baseline or receiving intervention. In the baseline / probe sessions a different narrative was used each session for 10 sessions and then the narratives were reused. In the intervention phase, probes were conducted before the intervention session that day.

Two probes were conducted in each session. The first probe was the *no icons* condition. The whiteboard was placed in landscape orientation in front of the student but was not used. The first author greeted the participant and gained their attention by saying that she was going to read a story and that the participant should listen and tell it back to the first author. If the participant began to talk while the first author was still reading the first author put up a hand and non-verbally indicated to the participant to stop talking. The first author read the narrative, paused for one to 2 seconds and then asked the participant to retell the story. When the participant stopped talking for 3 seconds, the first author thanked them but made no other comments.

The second probe was the *icon* condition and it was carried out immediately after the no icon probe, using the same stimulus story. The first author placed the seven macrostructure icons across the top of the whiteboard left to right in the following order, *who*, *what + where*, *problem*, *feeling about the problem*, *do*, *next* and *end*. The first author did not explain the macrostructure icons. The same procedure was used as for the icon condition.

The participants' responses were transcribed by the first author as much as possible during the probe sessions, but all of the probes and intervention sessions were video recorded to allow for baseline and probe transcription, coding, and interrater and procedural reliability. All probes were transcribed verbatim by the first author, including fillers, false starts and idiosyncratic articulation. If the first author was not able to understand the participant on the recording then it was replayed at 50% playback speed to ensure the participants were not penalized for lack of intelligibility.

After 20 probes with Zoe the first author discontinued transcription during the probe sessions and relied on the video recording only. It appeared that Zoe would keep talking, including extended talking off topic as long as the first author was writing. When transcription ceased, this behavior also ceased. This change was only made for Zoe.

### Intervention

Intervention was implemented by the first author immediately after the probes. Participants received four intervention sessions over 3 days each week. Intervention sessions were conducted one to one in a small room next to the participants' classroom. All intervention sessions were conducted with the first author sitting next to the participant. In the intervention sessions a different narrative was used for 20 sessions and then the intervention narratives were reused.

The intervention procedure was designed so that the participant produced each element of the retell separately in response to questioning and then they would say the entire retell independently. The procedure is outlined in Table 2. Specific wording used by the first author during the intervention reflected the participant's language level (e.g. "He couldn't get to sleep because he was scared." or "He couldn't get to sleep. He was scared."). Reminders to attend and/or praise for being on task were used as needed.

The seven macrostructure icons were presented as in the baseline and probe conditions. The first author stated that she was going to read another story and that the participant should listen because they would have to retell the story. The first author waited for the participant to indicate that they were ready to begin.

**Table 2** Key Steps of Fictional Narrative Retell Intervention

Key Steps
1. Whiteboard in landscape with 7 icons across the top
2. Read narrative
3. Ask participant to retell narrative
4. Elicit each macrostructure element individually
5. Error correction as necessary
6. Repetition or modeling of correct information
7. Place icon at bottom of board as each element elicited
8. Leave icons at bottom of board
9. Researcher requests participant to say whole retell and points to icons
10. Error correction as necessary
11. Researcher provides narrative model and points to icons
12. Second opportunity for participant to say narrative if required
13. Error correction as necessary



The first author read the intervention narrative, asked the participant to retell the story, then immediately asked the participant to say *who* was in the story while simultaneously pointing to the icon for *who* at the top of the board. If the participant responded correctly the first author provided confirming feedback (e.g., *state name of character* you told me who was in the story) and moved the *who* icon to the bottom of the whiteboard. If the participant provided no response, a partially correct response or an incorrect response the first author modeled the correct response then asked the participant again who was in the story. If the participant responded correctly the first author restated the correct information and confirmed that the participant had said who was in the story, pointed to the *who* icon and moved it to the bottom of the whiteboard. If the participant again provided no response, a partially correct response or an incorrect response, the first author stated the correct information, stated that it is the *who* information, pointed to the *who* icon and moved it to the bottom of the whiteboard. The same procedure was followed for the remaining macrostructure elements until all the icons were at the bottom of the board.

The first author then asked the participant to retell the entire narrative, pointing to the *who* icon as a cue to begin. As the participant provided information for each macrostructure element the first author pointed to the next macrostructure icon. If the participant provided no information, partially correct information or incorrect information for any macrostructure element the first author immediately provided the correct information for the whole of the element and then pointed to the next macrostructure icon card.

When the participant had finished their retell, the first author retold the whole narrative, while pointing to the relevant macrostructure icon. If the participant made an error during the first opportunity to retell the narrative the first author asked the participant to say the entire narrative again, pointing to the *who* icon as a cue to begin. If the participant again made an error the first author provided the correct information and immediately moved onto the next macrostructure element. To conclude the session the first author told the participant that they did a great job and they were finished.

A gradual introduction of the seven macrostructure components was implemented for each participant. In the first intervention session, the *who*, *what + where* and *problem* elements were elicited and retold, in the second session *feelings about the problem* and *do* were added and from the third session, all macrostructure elements were included.

After 33 intervention sessions Monica was still not consistently including the *do*, *next*, and *end* components in probe conditions. The first author amended the intervention procedure to highlight those macrostructure elements. After the first author asked for the *do* information, the correct answer was modeled straight away and the question was asked again. The correct answer and error correction procedures remained the same. Similarly, the correct answer was modeled straight away for the *next* and *end* macrostructure components. This change was only for Monica.

After seven intervention sessions with Stephano a narrative retell with no icon component was added to the end of each intervention session, as he had begun to show an intervention affect in the icon condition but was still scoring zero in the no icon condition. After he retold the whole narrative with icons the icon cards were



removed and the first author stated that he could also retell the story without the cards. The first author asked Stephano to retell the narrative, pointing to the place where the icon for *who* would have been as a cue to begin. This change to the intervention was made only for Stephano.

### Maintenance Probes

Maintenance probes were collected for all participants under the same conditions as baseline and intervention probes. Five maintenance probes were collected for Monica up to 26 weeks after intervention ceased, four were collected for Andre in the no icons condition and 3 in the icons condition up to 15 weeks after intervention, three were collected for Stephano up to 15 weeks after intervention, and two were collected for Zoe up to 8 weeks after intervention had ceased.

### Generalization Probes

The daily probes were a measure of generalization, as the probe stories were untaught. In addition, generalization data across stimulus types, using three storybooks that had not been read to the class but were indicated by the classroom teacher as being typical of classroom use, were collected in both the no icons and the icons condition. Generalization data were collected under the same conditions as the probes. Data were collected during the intervention and maintenance phases for Monica and Andre, and in the baseline, intervention and maintenance phases for Zoe and Stephano.

### Transcript Reliability

A research assistant independently transcribed 20% of randomly selected probes. For training purposes the research assistant was instructed to transcribe the recordings verbatim including all false starts, fillers and idiosyncratic articulations and indicate blocks of unintelligible speech as UI (unintelligible). They could play the recording as often as was needed to allow full transcription and at a reduced speed. The research assistant transcribed three recordings not used for transcript reliability and the first author conducted reliability as described below. Training reliability was 80%.

Each participant's probes were assigned a number and then selected for reliability using a random number generator ([www.random.org](http://www.random.org)). The first author's transcription was the base transcription and the research assistant's was compared against it. All words were counted in each base transcription. Fillers were not included in assessment of transcript reliability. The differences between the 2 transcriptions were recorded and divided into differences that could lead to coding changes and those that could not. Differences that could lead to coding changes were those involving essential information to the story (e.g., "He was a surprise" versus "He wasn't surprise"). Overall transcript reliability was 76% (range 73–78%). Monica's overall transcript reliability was 78% (range 65–93%), Andre's was 76% (range 59–83%), Zoe's was 73% (range 63–84%) and Stephano's was 76% (range 40–100%). Only 4% of disagreements lead to coding changes.

### Coding Reliability

A different trained research assistant independently coded the same 20% of participants' narrative retell transcripts. For training purposes the research assistant was provided with a copy of general scoring rubric and the specific scoring rubric for each narrative. Coding for one narrative not used for reliability was then discussed. Twelve further transcripts not used for reliability were selected for coding practice. 86% agreement was achieved overall on the training scripts. Disagreements were discussed.

Reliability was calculated by dividing agreements by agreements plus disagreements. Overall reliability across all seven macrostructure components was 89%. Overall reliability was: Andre 92% (range 86–100%), Monica 86% (range 57–100%), Zoe 87% (range 57–100%) and Stephano 95% (range 92–100%). The low scores for Monica and Zoe resulted from coders having three disagreements on three different occasions. The disagreements were due to the participants' disordered language structures leading to content being interpreted differently. Reliability across the individual macrostructure components was: *who* 96%, *what + where* 96%, *problem* 82%, *feeling* 93%, *do* 71%, *next* 78%, and *end* 84%. The information contained in the *do* component of the stories was complex information making coding judgment more challenging. Given that total scores for narratives were used as the dependent variable, a Pearson correlation was also calculated between the total scores for each rater, resulting in a correlation of 0.98 in the no icons condition and 0.97 in the icons condition.

### Procedural Reliability

A trained research assistant also conducted a procedural reliability check on the same 20% of all intervention sessions using a procedural reliability checklist (available from first author on request). For training purposes a procedural reliability checklist was provided to and discussed with the research assistant. The first author and the research assistant watched one intervention session together and jointly conducted reliability as described below. The research assistant then independently conducted reliability on two more intervention sessions. Questions arising were discussed. For reliability scoring purposes each step was scored as either correctly or incorrectly completed. Steps that were not carried out were scored as errors. Steps that were not required, for example the error correction steps if no errors occurred, were not included in the final calculations. Overall procedural reliability was 97% (range 91–100%).

### Social Validity

Two social validity measures were conducted. The purpose of the first measure was to determine whether a naïve observer rated baseline or intervention narratives as better. A school volunteer with experience interpreting disordered language read five pairs of transcribed retells for each participant. Each pair consisted of the participant's first attempt at retelling a narrative in baseline and their final attempt at retelling the same narrative after intervention. The order of baseline and intervention retells within each pair was randomized and the rater was asked to read the paired retells and judge which was the better story. The rater was given the original narrative but no explanation of what constituted a better story.

The primary purpose of the second measure of social validity was to determine whether macrostructural elements from a participant narrative could be extracted without access to the original story. Four school staff members were trained by the first author using two training scripts. The training exercise involved teachers individually extracting macrostructure elements then discussing the outcomes as a group.

Each of the staff members read five randomly selected pairs of retell transcripts for one participant. Each pair of retells consisted of one retell from baseline or, if a particular story was not available from baseline, from early intervention, (this occurred on three of a total of 20 occasions across the four participants) and one retell from the final third of intervention. The first author used a random number generator ([www.random.org](http://www.random.org)) to select narrative retells that would be presented together for each participant. For each narrative in each pair teachers were asked to extract and record the macrostructure information (*who, what + where, problem, feelings, do, next, end*) of each story and then judge which was the better narrative. The teachers were not given the original story or any explanation of what constituted a better story.

## Results

Figure 1 shows the effects of oral narrative intervention on the macrostructure of fictional narrative retell for each participant in the no icons condition. Figure 2 shows the effect of oral narrative intervention on the macrostructure of fictional narrative retell for each participant in the icons condition.

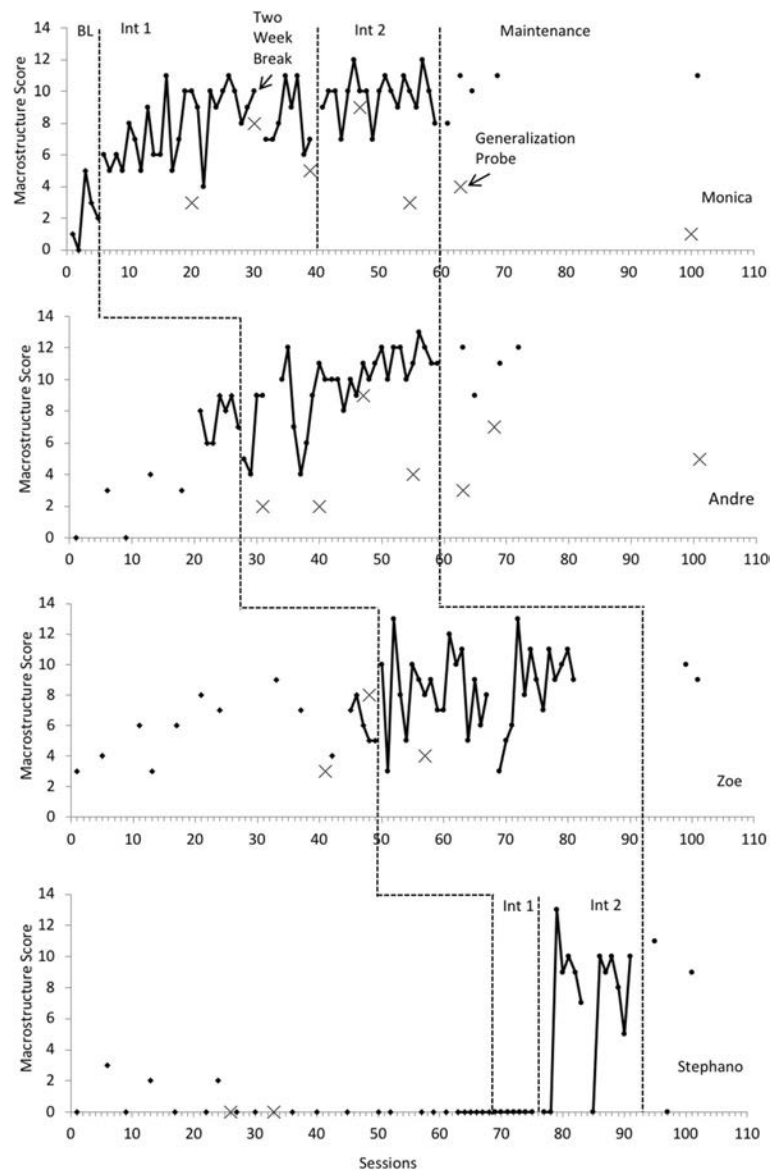
Monica received 52 intervention sessions and approximately 5 hours of intervention. Intervention sessions ranged between approximately 4 and 8 minutes in length. Examination of the Figs. 1 and 2 indicates an intervention effect for Monica. Her baseline scores in both conditions were low, despite one high score in the icons condition. Her scores increased quickly in both conditions once intervention began and despite variability in scores display a general upward trend.

Ideally after Monica showed an intervention effect intervention should have started with Stephano, based on his low stable baseline, however due to classroom considerations intervention began with Andre. He received 30 intervention sessions and approximately 2 hours and 30 minutes of intervention. Intervention sessions ranged between 3 and 8 minutes in length. His baseline score in the no icons condition was stable and even though his true baseline was higher than the weekly probes, intervention data showed no upward trend. His intervention data was initially quite variable but then showed a clear upward trend with a higher degree of stability of scores.

Andre's baseline scores in the icons condition were variable. There was an upward trend in his true baseline but it stabilized before intervention began. His intervention scores in the icon condition were also initially variable but then became more stable.

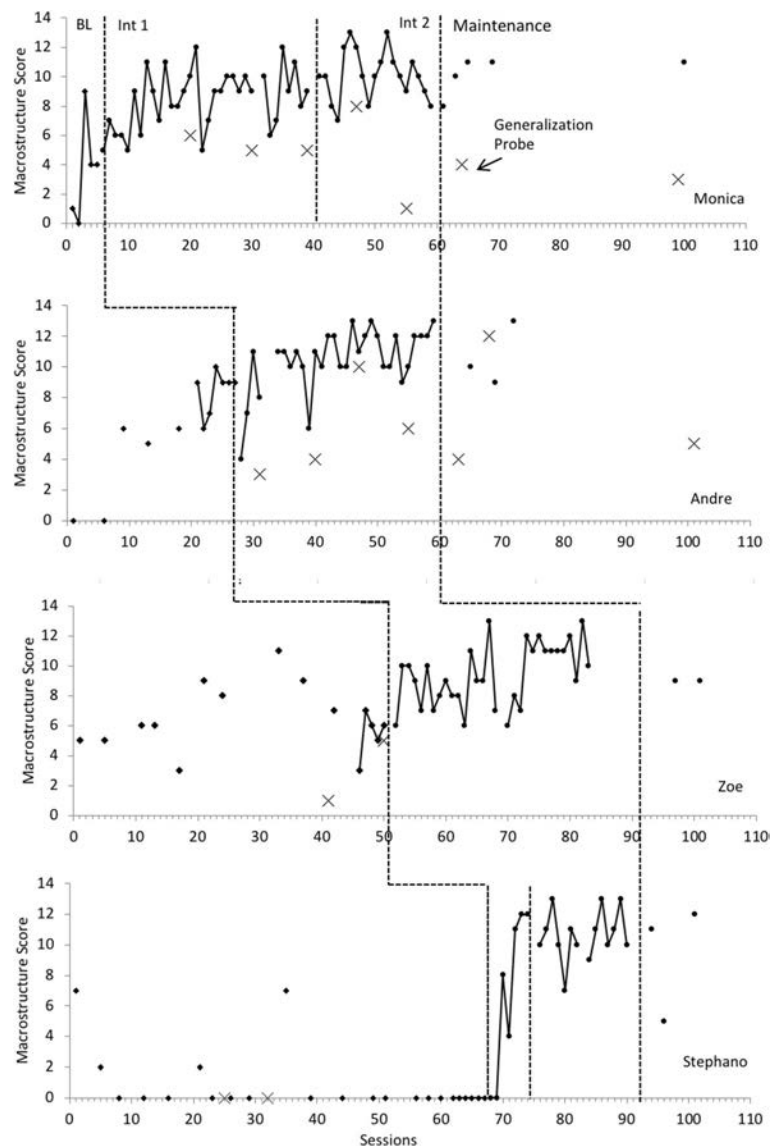
Zoe received 31 intervention sessions and approximately 3 hours of intervention. Sessions ranged between 5 and 6 min. Her mean scores increased from 5.8 in the weekly probe to 8.45 in intervention in the no icon condition. Her data was variable in both conditions however and an intervention effect was not clearly demonstrated.

Stephano received 21 intervention sessions and approximately 2 hours of intervention, with sessions ranging between 5 and 7 min. Baseline scores in both conditions were low and stable, and he scored 0 in all probes in true baseline. He quickly showed



**Fig. 1** no icons

an intervention effect in the icons condition and all data points except one, were at or above the highest baseline data point. He did not show an intervention effect at the same time in the no icons condition and a decision was made to introduce a structured fading of icons in the intervention procedure after seven intervention sessions, as described in the method. He showed an intervention effect two sessions after the change in the intervention procedure, scoring between 5 and 13 on the remaining probes on all but on one occasion when he scored 0 after a 2-week school break.



**Fig. 2** icons

In the first measure of social validity the naïve observer selected the intervention narrative as better than the baseline narrative in 90% of the paired transcripts. In the second measure of social validity each staff member selected the late intervention narrative as the better narrative in five out of five pairs. The teachers identified 11 (out of a possible 35) macrostructure elements from the early retells and 34 (out of a possible 35) macrostructure elements from the late intervention retells. For Andre teachers correctly identified 21 from early retells and 34 out of 35 from late intervention. For Zoe, teachers identified 15 from early retells and 27 from late intervention and for Stephano 3 were identified from early retells and 23 from late intervention.

## Discussion

The aim of this pilot study was to improve the capacity of four participants with ASD and severe language impairment to retell a short fictional narrative. This study has extended the existing body of research with participants with ASD by including participants with lower levels of intellectual ability than in previous oral narrative interventions (e.g., Gillam et al. 2015; Petersen et al. 2014) and by including participants with ASD and severe language impairment. The measurement of macrostructure used to score the dependent variable was reliable and, despite the severe language impairment of the participants, no significant problems were encountered in its application. The results of this intervention are in keeping with previously reported interventions that have also used macrostructure icons, modeling of narrative, and the participant producing the entire narrative each session (Brown et al. 2014; Gillam et al. 2015; Miller et al. 2018; Petersen et al. 2014; Spencer et al. 2013; Spencer and Slocum 2010).

A strong experimental effect was demonstrated in both the no icons and the icons conditions for Monica and Stephano and a suggestive experimental effect in both conditions for Andre. Although Zoe's mean scores improved, the variability in her scores means that an experimental effect was not clearly demonstrated. It is also difficult to know the extent to which her absence seizures may have affected her performance. Although all four participants improved their performance following intervention, none achieved the maximum score. In order to achieve the maximum, participants were required to recall and produce seven different components of the story macrostructure. The participants' failure to achieve a maximum score could be due to a number of reasons. First the requirements of planning even a simple narrative retell may have exceeded the children's language capabilities. They may have been unable to allocate mental resources to both macrostructure and microstructure (Colozzo et al. 2011) resulting in a trade-off between language features (Crystal 1987). Second, the requirements of the task may also have placed excessive demands on working memory. Working memory enables an individual to store and process information at the same time (Baltruschat et al. 2011) and, although much of the evidence concerning working memory in individuals with ASD is conflicting, there is evidence for reduced working memory performance in those with ASD and cognitive delay (Poirer and Martin 2008). Finally, Zoe and Andre produced segments of unintelligible speech during their probes and it is possible that their scores were depressed, as some parts of some responses could not be understood.

The purpose of the present pilot study was, in part, to trial and refine intervention procedures. Revisions that were made to Monica and Stephano's intervention procedures highlight the benefits of single case research with this population. Children with ASD often have specific and idiosyncratic abilities (Busby et al. 2012; Nicholas et al. 2008) and, consequently, may respond differently to interventions. Single case research allows for changes to be made in the intervention procedure during a study to accommodate these individual responses.

While Monica made rapid and consistent progress with the first four elements, her progress plateaued and she struggled to consistently achieve a score of two in each of the *do*, *next* and *end* elements. Similarly, Andre demonstrated particular difficulty with the *next* component of the retell and, with hindsight, he may have benefited from extra intervention around that component. Previous researchers have noted that some elements of retells are more difficult than others and these more difficult elements may

require more teaching (Dimino et al. 1995). The revisions were designed to teach by example rather than by explaining the meanings of the elements *do*, *next* and *end*. The amendments to Monica's intervention did not lead to a consistent increase in her scores but it is possible that the complexity of the *do* and *next* elements in particular exceeded her language or cognitive capabilities. External factors also contributed to variability of scores in some instances when she was apparently distracted during the tasks. Monica was moved to maintenance conditions after 52 intervention sessions as it was considered that she had possibly reached her cognitive and linguistic limit.

Revisions were made to Stephano's intervention procedure after only seven intervention sessions, as he was not transferring the skills he gained in the icons condition to the no icons condition. A structured fading procedure was implemented where the icons were removed as a final step in the intervention and he was required to retell the intervention narrative without using the icons to guide him. He was then able to rapidly transfer skills developed using the icons to the no icons condition. Inclusion of additional fading procedures in the intervention was not a necessary step for the other participants.

Experimental control was not clearly demonstrated for Zoe and her data showed great variability, including some high scores in baseline. There were, however, 11 occasions out of 31 when her intervention probe data for the no icons condition were above the highest baseline data point. The case for intervention effect in the icons condition is stronger as she started to show some stability, at or above the highest baseline data point toward the end of the intervention period. This stability in the icons condition could be due to two factors. First, her increasing stability coincided with the change in probe collection conditions. Second, her better performance in the icons condition could be due to her explicit use of the icons to help her retell the story. She stated "I can use the icons to help me" very soon after the intervention had started.

Social validity data address the meaningfulness of the intervention, which includes showing that the intervention produced clinically important changes (Foster and Mash 1999; Wolf 1978). The results from the social validity measurements indicated that raters who were blind to the conditions under which a narrative retell had been produced, evaluated the later intervention narratives as being better than baseline narratives. They also indicated that the later intervention narratives of all participants included a higher number of recognizable and correct macrostructure components. Thus, there is strong evidence of meaningful improvement in narrative retell according to the assessment of blinded observers.

The daily probes used to measure intervention effects were a close measure of generalization as participants were not taught the probe narratives. The outcomes for this measure have been discussed above. An additional far measure of generalization was the participants' capacity to retell a storybook typical of classroom use. The participants were not able to generalize the taught macrostructure system when retelling these storybooks. The narratives in the storybooks typical of classroom use were more complex than the intervention narratives. Specifically, they were longer, had varied presentation of the macrostructure elements, contained more complex syntax and vocabulary and required some inference to establish a full understanding of the events. The difficulty with this measure of generalization could be that the storybooks typical of the classrooms were not well matched to the capabilities of the participants, at least with regard to independent narrative understanding and retell.



## Limitations

A number of limitations of the present pilot study should be acknowledged. The production of accurate transcripts was difficult for several reasons. First, participants presented with marked social pragmatic language deficits such as not speaking loudly enough, not facing the first author when talking and speaking quickly. These issues resulted in decreased intelligibility, even for motivated and familiar listeners. Second, due to severe language impairments, participants made a high number of unpredictable language errors. In addition, recording was conducted using an iPhone microphone and it is possible that use of a higher quality external microphone could have increased transcript reliability. Due to the difficulties in transcription, transcript reliability was marginal at 78%. It was, however conducted stringently. All utterances, not just those affecting coding were included in the reliability data. Critically, the majority of disagreements were over words or phrases that did not carry meaning for the coding (e.g., disagreements over whether the participant said *the* versus *a* or *ate it* versus *ated*) and had very limited effect on coding.

Transferring knowledge from the clinic to the classroom is important in the research to practice framework (Brown et al. 2014) and another limitation to the study is the individual delivery of the intervention by a speech language pathologist, which is not always practical in a school setting. The semi-scripted, short, intervention could however be modified for use by teachers as an individual or classroom based group intervention. Researchers in two previous studies have been able to show an intervention effect when delivering an oral narrative intervention to small groups (Brown et al. 2014; Spencer and Slocum 2010).

Finally, changes to the probe conditions need to be noted. Firstly, for Zoe when it was noted by the first author that a non-essential component of the data collection process was affecting her performance and secondly the change in the icon probe condition for Monica early in the study. These changes clearly compromise ability to infer causal influence and were threats to internal validity. Nevertheless, the purpose of the current pilot study was to trial measurement and this data will be useful in future research.

## Implications for Practice and Future Research

The outcomes of this pilot study are promising. The results from this study indicate that the intervention may be effective and it has supported the usefulness of previous interventions using similar strategies. The materials and strategies implemented in this study are potentially useful for a clinical or classroom practitioner, but given the limited research, caution should be used.

Future research in the area should incorporate a number of changes. Researchers in future narrative retell intervention studies should consider strategies to specifically address more complex narrative components, such as the *do* and *next* components of fictional narrative retells, to enable more complete information to be retold.

Researchers in future studies could also investigate the efficacy of small group intervention with participants with ASD and severe language impairment within the classroom. Finally, an area for future research could be the investigation of how to translate the effect of intervention with simple and predictable stories, such as the ones



used in this study, to more complex stories, for example, those where the elements are presented in an unpredictable order and where higher levels of inference are required. This might include progressively varying macrostructure element order and gradually increasing complexity to facilitate generalization to the more complex stories that are typically used in the classroom.

## Conclusion

In this paper the effects of an oral narrative intervention on the fictional narrative retells of four participants with ASD and severe language impairment are described. Key components of the intervention included the use of macrostructure icons to represent the components of a simple orally presented narrative, modeling the narrative, and the participants being required to retell an entire narrative each intervention session. There was reasonable evidence of efficacy of the intervention for three of the four participants with untaught narratives. Revisions to the intervention procedure were made for two participants, highlighting the suitability of single case research for this population. The learned skills were maintained but generalization to storybooks typical of classroom use did not occur. Areas for future research include investigation of group delivery, maximizing performance on more complex narrative components and transferring skills developed with simple short narratives to storybooks typical of classroom use.

## Compliance with Ethical Standards

**Ethical Approval** All procedures performed in the studies involving human participants were in accordance with the ethical standards of the institution and /or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent for participation in this study was obtained by the parents of the participants.

**Conflict of Interest** The first author declares that she has no conflict of interest. The second author declares that he has no conflict of interest. The third author declares that she has no conflict of interest.

## Appendix 1

Macrostructure Element	2 points	1 point	0
	the scorer should not need shared knowledge to understand the information	Key words or phrases, but not specific or clear, may be attributed to the wrong person	No / incorrect information,
Who	Main character's name or approximation of the name	Broad character description (the boy, the brother)	Pronouns, secondary character, any other name
What + where	Activity and the location (e.g. eating pizza in the kitchen)	Activity or location (e.g. say "home" or "eating pizza")	No information or incorrect information
Problem	Statement of what went wrong in the story -	Incomplete, not clear, uses vague vocabulary,	No information or incorrect information
Emotion	Specific emotion named in the narrative and attributed either explicitly or through context to the correct person	Correct emotion but attributed to the wrong person, Another emotion, or general behaviour related to the problem e.g. "didn't like it"	No information or incorrect information
Do	Specific information that states what the main character did to fix the problem, can use dialogue or description, may assume the voice of the character	Broad description of what was done e.g. asked for help, Correct actions but attributed to the wrong people or it's unclear	No information or incorrect information
Next	Complete description of the direct result of "do", what the secondary character does to help the main character, may assume the voice of the character	Broad description of what was done e.g. she helped her, Correct actions but attributed to the wrong people or it's unclear	No information or incorrect information
Ending	Descriptions that occur after the problem is fixed	Broad description of what happened e.g. it was better, Correct actions but attributed to the wrong people	No information or incorrect information

## Appendix 2

Yesterday Ryan got a sticker at school because he was following the class rules. When Ryan put his sticker in his sticker book it fell out because it wasn't sticky enough. He was sad because the sticker kept falling out of his book. Ryan put up his hand and asked, "Can I have another sticker please?" Then his teacher gave him a new sticker and it stayed in his book.

	2 points	1 point	0
<b>Who</b>	Ryan / any approximation of name	The boy	Him, he
<b>What + where</b>	Got a sticker at school (in the classroom)	At school / got a sticker / got a sticker book	
<b>Problem</b>	Sticker fell out	Not sticky / didn't work / fall off / sticker book is broken/ lose the sticker / fell out	
<b>Emotion</b>	Sad (clearly attributed to the correct character)	Emotion attributed to another character / didn't like it / another feasible emotion	
<b>Do</b>	Asked his teacher for another sticker / said "can I have another sticker?"	Asked the teacher / said sticker please / can I have another sticker book / said my sticker fell out	He said do please
<b>Next</b>	Teacher gave him a new / another sticker / teacher got a new sticker	Got another one / gave him one / she put a sticker / new sticker / yes OK / she gave him a sticker / he get sticker	He get the prize
<b>Ending</b>	Stayed in in his book / was sticky enough	Didn't fall off / put new sticker / it stay in / put the sticker in sticker book / Ryan sticker on / have new one	The end

## References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed, text rev ed.). Washington DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington: Author.
- Baixauli, I., Colomer, C., Roselló, B., & Miranda, A. (2016). Narratives of children with high-functioning autism spectrum disorder: A meta-analysis. *Research in Developmental Disabilities*, 59, 234–254. <https://doi.org/10.1016/j.ridd.2016.09.007>.
- Baltruschat, L., Hasselhorn, M., Tarbox, J., Dixon, D. R., Najdowski, A. C., Mullins, R. D., & Gould, E. R. (2011). Addressing working memory in children with autism through behavioral intervention. *Research in Autism Spectrum Disorders*, 5, 267–276. <https://doi.org/10.1016/j.rasd.2010.04.008>.
- Barnes, J. L., & Baron-Cohen, S. (2012). The big picture: Storytelling ability in adults with autism spectrum conditions. *Journal of Autism and Developmental Disorders*, 42, 1557–1565. <https://doi.org/10.1007/s10803-011-1388-5>.
- Baron-Cohen, S., Leslie, A. M., & Frith, U. (1986). Mechanical, behavioural and intentional understanding of picture stories in autistic children. *British Journal of Developmental Psychology*, 4, 113–125. <https://doi.org/10.1111/j.2044-835X.1986.tb01003.x>.
- Bishop, D. V. M., & Edmundson, A. (1987). Language-impaired 4-year-olds distinguishing transient from persistent impairment. *Journal of Speech and Hearing Disorders*, 52, 156–173. <https://doi.org/10.1044/jshd.5202.156>.
- Bliss, L. S., & McCabe, A. (2008). Personal narratives: Cultural differences and clinical implications. *Topics in Language Disorders*, 28, 162–177. <https://doi.org/10.1097/01.TLD.0000318936.31677.2d>.
- Bloome, D., Katz, L., & Champion, T. (2003). Young children's narratives and ideologies of language in classrooms. *Reading & Writing Quarterly*, 19, 205–223. <https://doi.org/10.1080/10573560308216>.

- Brown, J. A., Garzarek, J. E., & Donegan, K. L. (2014). Effects of a narrative intervention on story retelling in at-risk young children. *Topics in Early Childhood Special Education*, 34, 154–164. <https://doi.org/10.1177/0271121414536447>.
- Busby, R., Ingram, R., Bowron, R., Oliver, J., & Lyons, B. (2012). Teaching elementary children with autism: Addressing teacher challenges and preparation needs. *The Rural Educator*, 33. Retrieved from <http://epubs.library.msstate.edu/index.php/ruraleducator/article/view/146/190>
- Carnine, D. W., Silbert, J., Kame'enui, E. J., & Tarver, S. G. (2009). *Direct instruction reading* (5th ed.). Upper Saddle River: Pearson.
- Colozzo, P., Gillam, R. B., Wood, M., Schnell, R. D., & Johnston, J. R. (2011). Content and form in the narratives of children with specific language impairment. *Journal of Speech Language and Hearing Research*, 54, 1609–1627. [https://doi.org/10.1044/1092-4388\(2011/10-0247](https://doi.org/10.1044/1092-4388(2011/10-0247).
- Crystal, D. (1987). Towards a 'bucket' theory of language disability: Taking account of interaction between linguistic levels. *Clinical Linguistics & Phonetics*, 1, 7–22. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/02699208708985001>.
- Dimino, J. A., Taylor, R. M., & Gersten, R. M. (1995). Synthesis of the research on story grammar as a means to increase comprehension. *Reading & Writing Quarterly*, 11, 53–72. <https://doi.org/10.1080/1057356950110105>.
- Dunn, L. M., & Dunn, D. M. (2007). *Peabody picture vocabulary test: Fourth edition (PPVT-4) [assessment instrument]*. Minneapolis: Pearson Assessments.
- Eigsti, I., de Marchena, A. B., Schuh, J. M., & Kelley, E. (2011). Language acquisition in autism spectrum disorders: A developmental review. *Research in Autism Spectrum Disorders*, 5, 681–691. <https://doi.org/10.1016/j.rasd.2010.09.001>.
- Eisenberg, S. L., Ukrainetz, T. A., Hsu, J. R., Kaderavek, J. N., Justice, L. M., & Gillam, R. B. (2008). Noun phrase elaboration in children's spoken stories. *Language Speech and Hearing Services in Schools*, 39, 145–157. [https://doi.org/10.1044/0161-1461\(2008/014](https://doi.org/10.1044/0161-1461(2008/014).
- Favot, K., Carter, M., & Stephenson, J. (2018). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language impairment: A pilot study. *International Journal of Disability, Development and Education*. <https://doi.org/10.1080/1034912X.2018.1453049>.
- Finestack, L. H. (2012). Five principles to consider when providing narrative language intervention to children and adolescents with developmental disabilities. *Perspectives on Language Learning and Education*, 19, 147–154. <https://doi.org/10.1044/1le19.4.147>.
- Foster, S. L., & Mash, E. J. (1999). Assessing social validity in clinical treatment research: Issues and procedures. *Journal of Consulting and Clinical Psychology*, 67, 308–319. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.565.3507&rep=rep1&type=pdf>.
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech Language and Hearing Research*, 58, 920–933. [https://doi.org/10.1044/2015\\_JSLHR-L-14-0295](https://doi.org/10.1044/2015_JSLHR-L-14-0295).
- Greenhalgh, K. S., & Strong, C. J. (2001). Literate language features in spoken narratives of children with typical language and children with language impairments. *Language, Speech, and Hearing Services in Schools*, 32, 114–125. Retrieved from <http://lshss.pubs.asha.org/article.aspx?articleid=1780249>.
- Harrison, P., & Oakland, T. (2015). *Adaptive behavior assessment system: Third edition (ABAS-III) [assessment instrument]*. Torrance: Western Psychological Services.
- Hughes, D. L., McGillivray, L., & Schmidek, M. (1997). *Guide to narrative language: Procedures for assessment*. Eau Claire: Thinking Publications.
- Kaderavek, J. (2015). *Language disorders in children: Fundamental concepts of assessment and intervention* (2nd ed.). Boston: Pearson.
- Kaderavek, J. N., & Sulzby, E. (2000). Narrative production by children with and without specific language impairment oral narratives and emergent readings. *Journal of Speech, Language, and Hearing Research*, 43, 34–49. <https://doi.org/10.1044/jslhr.4301.34>.
- Kalmbach, J. (1980). The structure of narrative retelling. Retrieved from <http://files.eric.ed.gov/fulltext/ED216317.pdf>
- Kalmbach, J. R. (1986). Getting at the point of retellings. *Journal of Reading*, 29, 326–333. Retrieved from <http://www.jstor.org/stable/40031812>.
- Kazdin, A. E. (2011). *Single-case research designs* (2nd ed.). New York: Oxford University Press.
- King, D., Dockrell, J. E., & Stuart, M. (2013). Event narratives in 11–14 year olds with autistic spectrum disorder. *International Journal of Language and Communication Disorders*, 48, 522–533. <https://doi.org/10.1111/1460-6984.12025>.

- Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. What works clearinghouse. Retrieved from <http://files.eric.ed.gov/fulltext/ED510743.pdf>
- Mayer-Johnson. (2008). *Boardmaker*® (version 6) [computer software]. Solana Beach: Mayer-Johnson.
- McCabe, A. (1991). Preface: Structure as a way of understanding. In A. McCabe & C. Peterson (Eds.), *Developing narrative structure* (pp. X–XVII). Hillsdale: Lawrence Erlbaum Associates.
- McCabe, A., Bliss, L., Barra, G., & Bennett, M. (2008). Comparison of personal versus fictional narratives of children with language impairment. *American Journal of Speech-Language Pathology*, 17, 194–206. [https://doi.org/10.1044/1058-0360\(2008/019\)](https://doi.org/10.1044/1058-0360(2008/019)).
- Miller, R. D., Correa, V. I., & Katsiyannis, A. (2018). Effects of a story grammar intervention with repeated retells for english learners with language impairments. *Communication Disorders Quarterly*. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/1525740117751897>
- Nathanson, R., Crank, J. N., Saywitz, K. J., & Ruegg, E. (2007). Enhancing the oral narratives of children with learning disabilities. *Reading & Writing Quarterly*, 2, 315–331. <https://doi.org/10.1080/10573560701501610>.
- Nicholas, J. S., Charles, J. M., Carpenter, L. A., King, L. B., Jenner, W., & Spratt, E. G. (2008). Prevalence and characteristics of children with autism-spectrum disorders. *Annals of Epidemiology*, 18, 130–136. <https://doi.org/10.1016/j.annepidem.2007.10.013>.
- Petersen, D. B. (2011). A systematic review of narrative-based language intervention with children who have language impairment. *Communication Disorders Quarterly*, 32, 207–220. <https://doi.org/10.1177/1525740109353937>.
- Petersen, D. B., & Spencer, T. D. (2010a). *Test of Narrative Retell School Age: Examiner's Manual*. Retrieved from <http://www.languagedynamicsgroup.com/tnr.html>
- Petersen, D. B., & Spencer, T. D. (2010b). The Test of Narrative Retell (TNR) [Assessment instrument]. Retrieved from <http://www.languagedynamicsgroup.com/tnr.html>
- Petersen, D. B., Gillam, S. L., Spencer, T., & Gillam, R. B. (2010). The effects of literate narrative intervention on children with neurologically based language impairments: An early stage study. *Journal of Speech, Language, and Hearing Research*, 53, 961–981 Retrieved from <http://jslhr.pubs.asha.org/article.aspx?articleid=1781593>.
- Petersen, D. B., Brown, C. L., Ukrainetz, T. A., Wise, C., Spencer, T. D., & Zebre, J. (2014). Systematic individualized narrative language intervention on the personal narratives of children with autism. *Language, Speech, and Hearing Services in Schools*, 45, 67–86. [https://doi.org/10.1044/2013\\_LSHSS-12-0099](https://doi.org/10.1044/2013_LSHSS-12-0099).
- Peterson, C., & McCabe, A. (1991). Linking children's connective use and narrative macrostructure. In C. Peterson & A. McCabe (Eds.), *Developing narrative structure* (pp. 29–54). Hillsdale: Lawrence Erlbaum Associates, Inc. Retrieved from <http://psycnet.apa.org/psycinfo/1991-97747-001>.
- Poirer, M., & Martin, J. S. (2008). Working memory and immediate memory in autism spectrum disorders. In J. Boucher & D. Bowler (Eds.), *Memory in autism* (pp. 231–248). Cambridge: Cambridge University Press.
- Rog, L. (2003). *Guided reading basics: Organizing, managing and implementing a balanced literacy program in K-3*. Portland: Stenhouse Publishers.
- Roid, G. (2003). *Stanford-Binet intelligence scales: Fifth edition (SB-5) [assessment instrument]*. Itasca: Riverside Publishing.
- Schopler, E., Van Bourgondien, M. E., & Love, S. R. (2010). Childhood autism rating scale, second edition (CARS-2) [assessment instrument]. Los Angeles: Western Psychological Services.
- Segal, E. M., & Duchan, J. F. (1997). Interclausal connectives as indicators of structuring in narrative. In J. Costermans & M. Fayol (Eds.), *Processing interclausal relationships* (pp. 95–119). Mahwah: Lawrence Erlbaum.
- Semel, E., Wiig, E. H., & Secord, W. A. (2006). *Clinical Evaluation of Language Fundamentals: Fourth Edition, Australian and New Zealand Standardised Edition (CELF-4 A&NZ) [Assessment Instrument]*. Sydney: Pearson Clinical Assessment.
- Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (2005). *Vineland adaptive behavior scales: Second edition (Vineland-II) [assessment instrument]*. Circle Pines: AGS Publishing.
- Spencer, T. D., & Petersen, D. B. (2010). Test of Narrative Retell: Preschool (TNR:P) [Assessment Instrument]. Retrieved from <http://www.languagedynamicsgroup.com/tnr.html>
- Spencer, T. D., & Slocum, T. A. (2010). The effect of a narrative intervention on story retelling and personal story generation skills of preschoolers with risk factors and narrative language delays. *Journal of Early Intervention*, 32, 178–199. <https://doi.org/10.1177/1053815110379124>.

- Spencer, T. D., Kajian, M., Petersen, D. B., & Bilyk, N. (2013). Effects of an individualized narrative intervention on children's storytelling and comprehension skills. *Journal of Early Intervention*, 35, 243–269. <https://doi.org/10.1177/1053815114540002>.
- Stein, N. L., & Glenn, C. G. (1978). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), *New directions in discourse processing* (pp. 53–120). Norwood: Ablex Publishing Corporation.
- Tager-Flusberg, H. (1995). 'Once upon a ribbit': Stories narrated by autistic children. *British Journal of Developmental Psychology*, 13, 45–59. <https://doi.org/10.1111/j.2044-835X.1995.tb00663.x>.
- Wechsler, D. (2004). *Wechsler Preschool and Primary Scale of Intelligence: Third Edition, Australian and New Zealand Standardised Edition (WPPSI-III A&NZ) [Assessment Instrument]*. Sydney: Pearson Clinical Assessment.
- Wechsler, D. (2012). *Wechsler preschool and primary scale of intelligence: Fourth edition (WPPSI-IV) [assessment instrument]*. San Antonio: Psychological Corporation.
- Wellman, R. L., Lewis, B. A., Freebaim, L. A., Avrich, A. A., Hansen, A. J., & Stein, C. M. (2011). Narrative ability of children with speech sound disorders and the prediction of later literacy skills. *Language Speech and Hearing Services in Schools*, 42, 561–579. [https://doi.org/10.1044/0161-1461\(2011/10-0038](https://doi.org/10.1044/0161-1461(2011/10-0038).
- Westby, C. (1991). Learning to talk, talking to learn: Oral literate language differences. In C. S. Simon (Ed.), *Communication skills and classroom success* (pp. 334–357). Eau Claire: Thinking Publications.
- Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, 11, 203–214.

## **Chapter 5: The effects of an oral narrative intervention on the original fictional narratives of children with ASD and language disorder**

### **Chapter Overview**

This chapter includes two papers. The first is a “Brief report: A pilot study into the efficacy of a brief intervention to teach original fictional narratives to a child with ASD and language disorder” that was published in the *Australasian Journal of Special and Inclusive Education* (Favot, Carter, & Stephenson, 2019). The second paper “The effects of an oral narrative intervention on the fictional narratives of children with ASD and language disorder” is currently under review. Only one previous study has been conducted on the effects of intervention on original fictional narratives in children with ASD and that intervention was very intensive, involving between 17.5 and 27.5 hours of one to one intervention.

The purpose of the pilot AB study was to investigate the feasibility of a brief intervention to develop the fictional narrative macrostructure elements of *character, setting, problem, feelings* and *fix* in one 9-year-old child with ASD and language disorder. The intervention procedure proved feasible, and the participant included more macrostructure elements in his narratives post intervention. Evidence of limited generalisation was present.

The second paper in this chapter is an extension of the pilot study utilising a stronger experimental design. Following the pilot study, revisions were made to the data collection processes and to the generalisation materials. A multiple baseline with probe design was used to investigate the effect of intervention on the original fictional narratives of four children aged 9 to 10 years of age. An intervention effect, maintenance and generalisation to fantasy based fictional narratives was demonstrated for three participants. The studies presented in this chapter represent some of the first investigations into the effect of oral narrative intervention on fictional narratives of children with ASD. In addition, effects were

demonstrated with a relatively limited intervention, involving between 32 and 167 total minutes of teaching for each participant.

### **Publication Status**

Favot, K., Carter, M., & Stephenson, J. (2019). Brief report: A pilot study into the efficacy of a brief intervention to teach original fictional narratives to a child with ASD and language disorder. Advance online publication. *Australasian Journal of Special and Inclusive Education*, 1-7. doi:10.1017/jsi.2019.7

Favot, K., Carter, M., & Stephenson, J. (2019). The effects of an oral narrative intervention on the original fictional narratives of children with ASD and language disorder. Manuscript under review.



SPECIAL EDUCATION PERSPECTIVES

## Brief Report: A Pilot Study Into the Efficacy of a Brief Intervention to Teach Original Fictional Narratives to a Child With ASD and Language Disorder<sup>†</sup>

Kate Favot\*, Mark Carter and Jennifer Stephenson

Macquarie University, Australia

\*Corresponding author. Email: [kate.favot@mq.edu.au](mailto:kate.favot@mq.edu.au)

(Received 02 July 2018; revised 22 February 2019; accepted 29 March 2019)

### Abstract

The ability to generate narratives is important for literacy development. Children with autism spectrum disorder (ASD) have been found to generate less complex narratives than typically developing peers. This pilot AB study was designed to investigate the efficacy of a brief intervention procedure to develop the macrostructure of original fictional narratives based on a realistic scenario in one child, aged 9 years 8 months, with autism spectrum disorder and language disorder. The intervention targeted the characters, setting, problem, feelings, and fix of fictional narrative. Intervention involved the use of macrostructure icons, pictures to support the generation of narratives, clinician modelling, and the participant telling the entire narrative each session. The participant received 12 training sessions of 4–6 minutes each and the intervention was effective. Areas for future research include implementation of a stronger research design and investigation of generalisation to fantasy-based fictional narratives.

**Keywords:** narrative intervention; children; language disorder; autism spectrum disorder

Narratives are accounts of real or imaginary events (Lahey, 1988). They have been linked with academic success (Westby, 1991), notably reading comprehension (Morrow, 1985) and writing (Spencer & Petersen, 2018), and the school-based academic culture values narratives that are constructed according to rules of macrostructure (Petersen, Gillam, Spencer, & Gillam, 2010). Macrostructure has been called the core component of narrative (Peterson & McCabe, 1991) as it addresses story structure and typically includes setting, character, initiating event or problem, feelings, and a resolution (Hudson & Shapiro, 1991).

Original fictional narratives can be realistic or fantastical. Creating an original fictional narrative requires the narrator to coordinate understanding of the relevance of the narrative, structure their ideas within an accepted macrostructure framework, and use specific linguistic devices to create a cohesive text (Johnston, 2008). They must also understand the role characters play, the way they think and feel, and what motivates them to act (Benson, 1993).

Autism spectrum disorder (ASD) is a lifelong neurodevelopmental disorder characterised by impairments in social communication and interaction as well as by behavioural inflexibility (American Psychiatric Association, 2013). Difficulties with narrative have been found to occur in most individuals with ASD (Eigsti, de Marchena, Schuh, & Kelley, 2011), and individuals with ASD may produce narratives with impaired story structure (Norbury, Gemmell, & Paul, 2014). Given the diagnostic profile and narrative performance of individuals with ASD, and that

<sup>†</sup>This manuscript was accepted under the Editorship of David Paterson.

narrative deficits do not necessarily resolve without intervention (Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004), it is a logical target for intervention.

Intervention studies with children with ASD to develop the macrostructure of personal narrative (Favot, Carter, & Stephenson, 2018b; Petersen et al., 2014) and fictional narrative retells (Favot, Carter, & Stephenson, 2018a) have been conducted, but only one study has been conducted with children with ASD to develop original fictional narratives (Gillam, Hartzheim, Studenka, Simonsmeier, & Gillam, 2015). Children in this study had nonverbal intelligence within normal limits, and according to the severity ratings of the Clinical Evaluation of Language Fundamentals – Fourth Edition (Semel, Wiig, & Secord, 2003), one participant had language abilities within normal limits, two had a mild language disorder, and two had a severe language disorder. Probe narratives were collected by asking participants to look at a picture of a problem (e.g., missing the bus) and generate a narrative. An intensive individual intervention was provided, with between 17.5 to 27.5 hours for each participant. The intervention was effective for three of the five participants, including both participants with severe language disorder, on a combined measure of five macrostructure elements. Thus there is very little research on strategies to teach children with ASD and language disorder to generate original fictional narrative, and the single existing study employed an intensive intervention.

The purpose of this pilot study was to trial the methodology for a brief intervention for children with ASD and language disorder to develop original fictional narrative skills. The specific research questions were as follows:

1. Does individualised oral narrative intervention have an effect on the macrostructure of fictional narrative based on a realistic scenario produced by a school-aged child with ASD and language disorder?
2. Do improvements in the macrostructure of realistic original fictional narratives generalise to fantasy-based original fictional narratives?
3. Is the brief intervention feasible and what adjustments to intervention and measurement are necessary?

## Method

### Participant and Setting

Joe (pseudonym), aged 9 years 8 months, attended the university-based special education program where the intervention took place. The university research ethics committee approved the research, and written informed consent was collected from the participant's parents. Joe received a diagnosis of ASD from a paediatrician using the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013). His adaptive behaviour was rated as borderline on the Adaptive Behavior Assessment System II (Harrison & Oakland, 2015), his verbal IQ was in the low average range, and his processing speed in the extremely low range (Wechsler, 2016). An overall IQ score was not calculated due to a spread of subscale scores. His classroom teachers also reported that he was able to answer literal questions based on his reading age texts and was able to retell those stories providing 'who, what, where' information.

Joe's receptive language was in the moderate range of disorder and his expressive language in the severe range of disorder according to the Clinical Evaluation of Language Fundamentals, Australian and New Zealand Standardised Edition – Fifth Edition (Wiig, Secord, & Semel, 2017). His receptive vocabulary was low average on the Peabody Picture Vocabulary Test – Fourth Edition (Dunn & Dunn, 2007), and his narrative comprehension and production was below average according to the Test of Narrative Language – Second Edition (TNL-2; Gillam & Pearson, 2017). Joe was a monolingual English speaker, and his speech was intelligible to non-familiar listeners as judged by the researchers. He was able to participate in structured lessons as reported by his classroom teachers.

### Research Design

An AB design was implemented to investigate the effects of an explicit narrative intervention. A generalisation probe to fantasy-based fictional narratives was collected.

### Dependent Variable

The dependent variable was a combined measure of five macrostructure elements (character, setting, problem, feelings, and fix). Each of the five components was scored out of a possible 2 points, with a maximum possible total score of 10. Two marks were scored if the component was complete and specific (e.g., character's name) and 1 mark if the component was appropriate but not specific (e.g., the boy).

### Materials

The researcher used a whiteboard and Picture Communication Symbols (Mayer-Johnson, 2008), hereafter referred to as icons, to represent the five macrostructure elements in each session. Each of the icon cards had a picture representing the element and the name of the element written on it. A different stimulus picture, depicting an everyday problem (e.g., burnt toast, umbrella blown inside out), was used each day to collect the probe data. Where possible, the picture illustrated the problem only (e.g., close-up of broken Lego tower) but some necessarily included information relating to the setting and character. All stimulus pictures were collected from Google Images and were printed in colour.

### Probes

The participant sat next to the researcher at a desk in a small room for both the baseline and intervention probes. All probes were video recorded on an iPhone to allow for transcription and interrater reliability. The first probe was conducted using the stimulus picture only (no icons condition); the researcher directed the participant's attention to the picture and then asked him to make up a story about the picture. When he had stopped talking for 3 seconds the researcher thanked him. The second probe (icons condition) was conducted immediately after the first. The same stimulus picture stayed on the board and the five macrostructure icons were placed across the top of the board, left to right, in the following order: character, setting, problem, feelings, and fix. The researcher did not explain the icons. The same procedure was used in the second probe.

### Intervention

Intervention occurred immediately after the probes, using a different picture for each session. Joe received four 4–6 minute intervention sessions a week. The intervention was designed so that the participant could produce each macrostructure element separately after elicitation and then produce the whole narrative independently. The key stages and steps of the intervention are outlined in Table 1.

### Generalisation Probes

Generalisation probes to fantasy-based stimuli were collected preintervention using the picture of aliens in a park from the TNL-2 (Gillam & Pearson, 2017) and postintervention using a single picture from *There's An Alligator Under My Bed* (Mayer, 1987) in the no icons condition only. The pictures were placed in front of the participant, and he was asked to tell the best story he could.

**Table 1.** Key Stages and Steps of Original Fictional Narrative Intervention

Stage	Key steps
Introduce macrostructure elements	<ul style="list-style-type: none"> <li>Name 5 macrostructure elements individually and place icons across top of whiteboard in landscape orientation (e.g., 'When we tell a story we include the characters' and place icon on board, 'We include the setting', etc.)</li> </ul>
Present narrative picture	<ul style="list-style-type: none"> <li>Place picture stimulus on whiteboard and state, 'You're going to make up a story about this picture'</li> </ul>
Elicit problem	<ul style="list-style-type: none"> <li>State that before participant can make up a story, they need to know what the problem is</li> <li>Elicit <i>problem</i> (e.g., 'What could be the problem in this story?')</li> </ul>
	<ul style="list-style-type: none"> <li>If an appropriate response is provided, the interventionist gives affirming repetition of response</li> </ul>
	<ul style="list-style-type: none"> <li>If no response or partial response is given, the interventionist questions the participant to elicit more information (e.g., if the participant says, 'Broken', the interventionist could ask, 'What is broken?'). The interventionist then repeats or provides the full response again as a model</li> </ul>
Elicit all macrostructure elements	<ul style="list-style-type: none"> <li>Elicit each macrostructure element individually</li> <li>Follow elicitation, response and modelling procedures as above</li> </ul>
	<ul style="list-style-type: none"> <li>State name of element (e.g., 'You told me the characters in the story.') and move icon to bottom of board</li> </ul>
State whole narrative	<ul style="list-style-type: none"> <li>Researcher requests participant to say entire narrative (e.g., 'Now tell me the whole story.') – point to character icon as a cue for the participant to begin; point to each icon in turn</li> </ul>
	<ul style="list-style-type: none"> <li>If the participant produces an error (based on the narrative from the individual element elicitation stage), the interventionist immediately provides the correct information but doesn't request repetition</li> </ul>
	<ul style="list-style-type: none"> <li>Interventionist provides a model of narrative</li> </ul>
	<ul style="list-style-type: none"> <li>Second opportunity for participant to say narrative if errors in first opportunity, with error correction as necessary</li> </ul>

### Reliability

A trained observer independently recoded 20% of the daily probes. Reliability was calculated by dividing agreements by agreements plus disagreements. Overall coding reliability was 92%. The single coding disagreement resulted in a 1-point difference to the total score. The same trained observer conducted procedural reliability on 20% of randomly selected intervention sessions. Overall procedural reliability was 96%.

### Results

Figure 1 shows the effects of intervention on the macrostructure of original fictional narrative in the no icons condition, and Figure 2 shows the effect of intervention in the icons condition. A clear experimental effect was displayed in the icons condition but the rising baseline in no icons condition makes it difficult to confidently assert experimental control. The rising baseline in the no icons condition may have been because Joe started spontaneously reading the labels on the macrostructure icons during the baseline probes. Joe scored 8 in the preintervention generalisation probe and 9 in the postintervention probe. The intervention appeared to be feasible and effective with short intervention sessions of between 4 and 6 minutes each, approximately 55 minutes of intervention in total. No adjustments to the intervention were necessary.

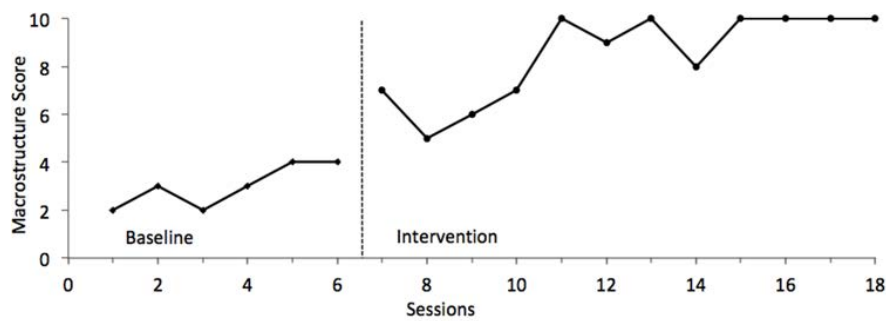


Figure 1. Macrostructure score in no icons condition.

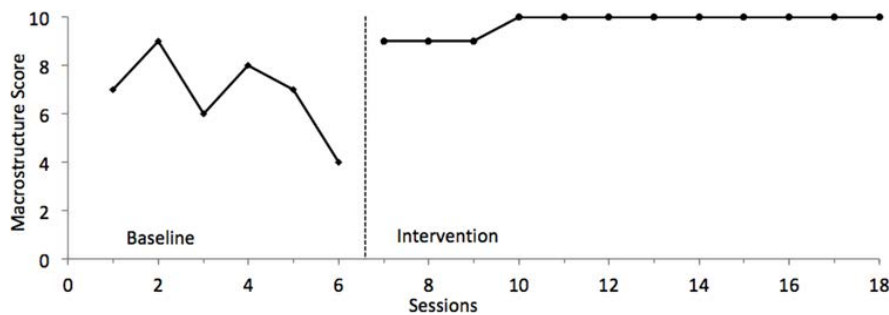


Figure 2. Macrostructure score in icons condition.

## Discussion

Based on the results, it appears that the intervention was effective and feasible. There was limited evidence of generalisation, possibly due to a measurement ceiling effect. Generalisation probes were collected at the end of a comprehensive narrative assessment in which the participant was exposed to multiple exemplar narratives as part of the TNL-2 (Gillam & Pearson, 2017). It is also possible that the stimulus materials used for generalisation elevated his scores, as the pictures provided character, setting, and problem information.

The total intervention time of 55 minutes compares with total intervention times of 23.5 to 27.5 hours for students with severe language impairment in the study of Gillam et al. (2015). The results of this pilot study indicate that more extensive research into this brief intervention to develop original narrative in children with ASD and language disorder is warranted.

The study has three limitations. First, the AB design is weak, but it was suitable for a pilot study to allow preliminary evaluation of the intervention (Alberto & Troutman, 2009) and to assist in refining procedures. Second, Joe started to read the names of the macrostructure elements on the cards during the true baseline phase. It is possible that by being exposed to the cards he was inadvertently receiving intervention, and this would need to be addressed in future research. The third limitation was the possibility that the preintervention generalisation scores were inflated. Future generalisation probes could include stimulus pictures with less macrostructural information, as well as verbal or written stimuli.

## Conclusion

There is a range of potential benefits in developing skills in narrative production, and narrative skills are linked to success in school, particularly in literacy-based areas such as reading comprehension and writing. The present study has provided preliminary evidence that a short intervention may be effective in developing fictional narrative skills in children with language disorders and ASD. Further, more rigorous studies are warranted.

## References

- Alberto, P. A., & Troutman, A. C. (2009). *Applied behavior analysis for teachers* (8th ed.). Upper Saddle River, NJ: Pearson.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Benson, M. S. (1993). The structure of four- and five-year-olds' narratives in pretend play and storytelling. *First Language*, 13, 203–223. <https://doi.org/10.1177/014272379301303803>
- Dunn, L. M., & Dunn, D. M. (2007). *Peabody Picture Vocabulary Test: Fourth Edition (PPVT-4)*. Minneapolis, MN: Pearson Assessments.
- Eigsti, I.-M., de Marchena, A. B., Schuh, J. M., & Kelley, E. (2011). Language acquisition in autism spectrum disorders: A developmental review. *Research in Autism Spectrum Disorders*, 5, 681–691. <https://doi.org/10.1016/j.rasd.2010.09.001>
- Favot, K., Carter, M., & Stephenson, J. (2018a). The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study. *Journal of Developmental and Physical Disabilities*, 30, 615–637. <https://doi.org/10.1007/s10882-018-9608-y>
- Favot, K., Carter, M., & Stephenson, J. (2018b). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language impairment: A pilot study. *International Journal of Disability, Development and Education*. Advance online publication. <https://doi.org/10.1080/1034912X.2018.1453049>
- Fey, M. E., Catts, H. W., Proctor-Williams, K., Tomblin, J. B., & Zhang, X. (2004). Oral and written story composition skills of children with language impairment. *Journal of Speech, Language, and Hearing Research*, 47, 1301–1318. [https://doi.org/10.1044/1092-4388\(2004/098\)](https://doi.org/10.1044/1092-4388(2004/098))
- Gillam, R. B., & Pearson, N. A. (2017). *Test of Narrative Language: Second Edition (TNL-2)*. Austin, TX: Pro-ed.
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech, Language, and Hearing Research*, 58, 920–933. [https://doi.org/10.1044/2015\\_JSLHR-L-14-0295](https://doi.org/10.1044/2015_JSLHR-L-14-0295)
- Harrison, P., & Oakland, T. (2015). *Adaptive Behavior Assessment System: Third Edition (ABAS-III)*. Torrance, CA: Western Psychological Services.
- Hudson, J. A., & Shapiro, L. R. (1991). From knowing to telling: The development of children's scripts, stories, and personal narratives. In A. McCabe & C. Peterson (Eds.), *Developing narrative structure* (pp. 89–136). Hillsdale, NJ: Erlbaum.
- Johnston, J. R. (2008). Narratives: Twenty-five years later. *Topics in Language Disorders*, 28, 93–98. <https://doi.org/10.1097/01.TLD.0000318931.08807.01>
- Lahey, M. (1988). *Language disorders and language development*. New York, NY: Collier Macmillan.
- Mayer, M. (1987). *There's an alligator under my bed*. New York, NY: Penguin.
- Mayer-Johnson. (2008). Boardmaker (Version 6) [Computer software]. Solana Beach, CA: Mayer-Johnson.
- Morrow, L. M. (1985). Retelling stories: A strategy for improving young children's comprehension, concept of story structure, and oral language complexity. *The Elementary School Journal*, 85, 646–661. <https://doi.org/10.1086/461427>
- Norbury, C. F., Gemmell, T., & Paul, R. (2014). Pragmatics abilities in narrative production: A cross-disorder comparison. *Journal of Child Language*, 41, 485–510. <https://doi.org/10.1017/S030500091300007X>
- Petersen, D. B., Brown, C. L., Ukrainetz, T. A., Wise, C., Spencer, T. D., & Zebre, J. (2014). Systematic individualized narrative language intervention on the personal narratives of children with autism. *Language, Speech, and Hearing Services in Schools*, 45, 67–86. [https://doi.org/10.1044/2013\\_LSHSS-12-0099](https://doi.org/10.1044/2013_LSHSS-12-0099)
- Petersen, D. B., Gillam, S. L., Spencer, T., & Gillam, R. B. (2010). The effects of literate narrative intervention on children with neurologically based language impairments: An early stage study. *Journal of Speech, Language, and Hearing Research*, 53, 961–981. [https://doi.org/10.1044/1092-4388\(2009/09-0001\)](https://doi.org/10.1044/1092-4388(2009/09-0001))
- Peterson, C., & McCabe, A. (1991). Linking children's connective use and narrative macrostructure. In A. McCabe & C. Peterson (Eds.), *Developing narrative structure* (pp. 29–53). Hillsdale, NJ: Erlbaum. Retrieved from <http://psycnet.apa.org/psycinfo/1991-97747-001>
- Semel, E. M., Wiig, E. H., & Secord, W. (2003). *Clinical Evaluation of Language Fundamentals: Fourth Edition*. Toronto, Canada: The Psychological Corporation.
- Spencer, T. D., & Petersen, D. B. (2018). Bridging oral and written language: An oral narrative language intervention study with writing outcomes. *Language, Speech, and Hearing Services in Schools*, 49, 569–581. [https://doi.org/10.1044/2018\\_lshss-17-0030](https://doi.org/10.1044/2018_lshss-17-0030)

- Wechsler, D. (2016). *Wechsler Intelligence Scales for Children: Fifth Edition, Australian and New Zealand Standardised Edition (WISC-V A&NZ)*. Sydney, Australia: Pearson Clinical Assessment.
- Westby, C. (1991). Learning to talk, talking to learn: Oral literate language differences. In C. S. Simon (Ed.), *Communication skills and classroom success: Assessment and therapy methodologies for language and learning disabled students* (pp. 334–357). Eau Claire, WI: Thinking Publications.
- Wiig, E. H., Secord, W. A., & Semel, E. (2017). *Clinical Evaluation of Language Fundamentals: Fifth Edition, Australian and New Zealand Standardised Edition (CELF-5 A&NZ)*. Sydney, Australia: Pearson Clinical Assessment.

---

**Cite this article:** Favot, K., Carter, M., & Stephenson, J. Brief report: A pilot study into the efficacy of a brief intervention to teach original fictional narratives to a child with ASD and language disorder. *Australasian Journal of Special and Inclusive Education*. <https://doi.org/10.1017/jsi.2019.7>

The effects of an oral narrative intervention on the fictional narratives of children with ASD  
and language disorder

Kate Favot, Mark Carter and Jennifer Stephenson  
Macquarie University

Kate Favot <sup>a1</sup>, Mark Carter <sup>a2</sup>, Jennifer Stephenson <sup>a2</sup>

<sup>a</sup> Macquarie University Special Education Centre, Macquarie University, Sydney, NSW,  
2109 Australia, <sup>1</sup> Masters of Research, <sup>2</sup> Doctor of Philosophy

kate.favot@mq.edu.au

mark.carter@mq.edu.au

jennifer.stephenson@mq.edu.au

Correspondence concerning this article should be addressed to

Kate Favot, Macquarie University Special Education Centre, Sydney, NSW, 2109 Australia

Email: kate.favot@mq.edu.au

**Disclosure of potential conflicts of interests:** The authors declare that they have no conflict of interest.

**Funding:** No grants or any other financial support was received for this paper.



## Abstract

A multiple baseline across participants design was used to examine the effects of intervention on reality-based fictional narratives. Four boys aged 9 to 10 participated in a 1:1 intervention targeting the narrative macrostructure elements of *character, setting, problem, feelings, and fix*. Intervention involved the use of narrative stimulus pictures, macrostructure icons, participants saying the entire narrative and clinician modelling. An intervention effect, maintenance and generalization to fantasy-based fictional narratives were demonstrated for three participants. Social validity measures indicated that a naive observer rated post intervention narratives as better than pre intervention narratives. This study adds to the limited research into narrative intervention with children with ASD and co-occurring language disorder. The highly structured and semi scripted intervention could be adapted to be delivered by teachers in small groups in the classroom. Areas for future research include implementing the intervention with small groups and targeting more complex narrative macrostructure.

Keywords: original fictional narrative, intervention, autism spectrum disorder, language disorder, children

Narratives are monologues describing real or imaginary events (Kaderavek, 2015) and represent the earliest developing extended discourse (Hedberg & Westby, 1993). Personal narratives relate real events and fictional narratives retell or generate imaginary events (Rollins, 2014). Children begin to generate personal narratives and original fictional characters by two (Allen, Kertoy, Sherblom, & Pettit, 1994; Sperry & Sperry, 1996), and original fictional plots by age three (Benson, 1993). By the time children in mainstream western cultures enter school most are familiar with, and are expected to, produce both personal and fictional narratives (Owens, 2016).

The capacity to generate narratives has been linked to the development of autobiographical memory (Reese & Newcombe, 2007), social relationships (Cheshire, 2000), and language (Bishop & Edmundson, 1987). Narratives have been called a bridge between oral language and literacy (Westby, 1991) as well as a predictor of academic success (Feagans & Appelbaum, 1986; Hughes, McGillivray, & Schmidek, 1997; Westby, 1991) as they are a naturalistic means of processing abstract thought and generating the sequenced and complex language that is required in academic domains (Petersen, 2011). Specifically, being able to generate oral narratives has been linked to improved performance in reading comprehension (Morrow, 1985) and written narratives (Spencer & Petersen, 2018).

Within the school based academic culture, a high value is placed on narratives that are produced according to conventions of macrostructure (Caldwell & White, 2017; McCabe, 1991; Petersen, Gillam, Spencer, & Gillam, 2010), and microstructure (King, Dockrell, & Stuart, 2014). Macrostructure incorporates relevant content (Finestack, 2012) within an overall story grammar structure (Hudson & Shapiro, 1991) that typically includes setting, character, initiating event or problem, internal response and a resolution (Hudson & Shapiro, 1991). Microstructure incorporates measures of productivity (e.g., total number of words) and measures of complexity (e.g. coordinating and subordinating conjunctions) (Justice et al.,

2006). Elements of microstructure support the structural sequence and aid understanding of macrostructure components (Spencer, Kajian, Petersen, & Bilyk, 2013).

### **Original Fictional Narratives**

Original fictional narratives are a class of narratives that represent fabricated but realistic events, or unrealistic fantasy. Paley (1990) suggests that being able to generate original fictional narratives from an early age is the prototype for imaginative pursuits throughout life, with the added value that the narrator is able to structure events as they choose (Engel, 1995).

In the mainstream western academic school system, generating original fictional narratives plays a central role in language and literacy education (Caldwell & White, 2017). Original fictional narratives are a target of instruction and an outcome measure of the Australian (see Australian Curriculum, Assessment and Reporting Authority [ACARA], 2016) and the U.K English curricula (see Department of Education, 2014) and form part of U.S Common Core Standards for the language arts (see National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010).

Generating an original narrative places considerable demands on the narrator. The narrator must produce ideas based on a provided stimulus, structure their ideas within a macrostructure framework, and use specific linguistic devices to create a cohesive text (Johnston, 2008). Creation and planning of an original fictional story may place a greater cognitive and linguistic load on narrators than retelling a fictional story or telling a personal story as narrators have to create and plan the story without the help of a model (Westerveld & Gillon, 2010) or memory of events, and understand the role characters play, the way they think and feel and what motivates them to act (Benson, 1993).

### **Narrative in ASD**

Authors of two literature reviews have presented findings from investigations into the narrative production skills of individuals with ASD and have concluded that despite wide variation in methodologies and findings, commonalities in the narrative skills of individuals with ASD are beginning to emerge (Baixauli, Colomer, Roselló, & Miranda, 2016; Stirling et al., 2014). Baixauli et al. (2016) and Stirling et al. (2014) concluded that children with ASD may include fewer macrostructure elements in their narratives than typically developing peers, that all macrostructure elements can be impaired but that no one element is likely to be more impaired than any other element, and that narratives of individuals with ASD may be shorter and less semantically and syntactically complex than those of typically developing peers.

Original narrative production in children with ASD has most commonly been studied using wordless picture books (Losh & Capps, 2003; Norbury & Bishop, 2003). Such highly structured stimulus materials reduce the narrative demands on individuals as the stimulus materials provide the required macrostructure (Hedberg & Westby, 1993; McCabe, Bliss, Barra, & Bennett, 2008). Consequently, when macrostructure analysis is applied to narratives elicited in this way, narrative macrostructure skills may be overestimated (Hedberg & Westby, 1993) and narrative deficits underestimation.

Individuals with ASD may struggle to generate narratives for a number of reasons. Cognitive processing difficulties associated with ASD (e.g., theory of mind, executive function, weak central coherence theory) may impact on ability to produce narratives (King et.al., 2014). The quality of narratives generated by individuals with ASD may also be affected by cognitive impairment, expressive, or receptive language disorder.

### **Narrative Intervention with ASD**

Despite the importance of narrative to personal, social and academic success and the documented difficulties with narrative that individuals with ASD experience, the effects of

oral narrative intervention on the oral narratives of children with ASD have been investigated in only four studies. Researchers have conducted investigations into the efficacy of interventions to develop high point personal narrative (Petersen et al., 2014) early developing personal narrative (Favot, Carter, & Stephenson, 2018b), fictional narrative retells (Favot, Carter, & Stephenson, 2018b) and original fictional narratives (Gillam, Hartzheim, Studenka, Simonsmeier, & Gillam, 2015). A multiple baseline design was used in all four studies and all included measures of macrostructure as a dependent variable. Data collected in all studies suggest that explicit intervention that incorporates the use of icons to represent macrostructure elements, pictures to support narratives, clinicians modelling an entire narrative, guided practice and participants producing an entire narrative each intervention session, may be effective in developing narratives in children with ASD.

Currently, Gillam et al. (2015) have reported the only study addressing the teaching of fictional narratives to children with a diagnosis of autism. They used a multiple baseline design and employed an intensive intervention, involving between 17.5 and 27.5 hours of one to one teaching, to investigate the effect of intervention on the macrostructure and microstructure of narratives produced by five participants. All participants presented with non-verbal intelligence within normal limits, and, according to the Clinical Evaluation of Language Fundamentals, Fourth Edition (Semel, Wiig, & Secord, 2003), two participants had severe language disorder, two had a borderline language disorder and one had language abilities within the average range. Probes were conducted after alternate intervention sessions. The intervention was effective, and maintenance was reported for four participants on a combined measure of five macrostructure elements (story knowledge index). Generalization was not examined.

The aim of the study reported here is to extend the findings in the existing literature by exploring the extent to which a less intensive intervention than that employed by Gillam et al.

(2015) is effective in developing the original narratives of children with ASD and co-occurring language disorder. The specific research questions were:

1. Does a brief individualized oral narrative intervention have an effect on the macrostructure of original fictional narratives based on a realistic problem, produced by school-aged children with ASD and co-occurring language disorder?
2. Do improvements in the macrostructure of original fictional narratives maintain after intervention has stopped?
3. Do improvements in the macrostructure of original fictional narratives generalize to fantasy-based original fictional narratives?

## Method

### **Experimental Design**

A multiple baseline with probe across participants design was used to investigate the effect of a brief oral narrative intervention on the original fictional narratives of school aged children with ASD and co-occurring language disorder. This design provides a robust alternative to holding participants on continuous baseline, which may be both impractical and reactive (Horner & Baer, 1978) . The University Human Research Ethics Committee approved the research.

### **Participants**

Four boys, Jem, Dashiell, Atticus, and Cooper (pseudonyms) who attended the university based special education program where the intervention took place, were selected to participate in this intervention study. The participants attended the program Monday to Friday and received instruction in a broad educational program with a focus on literacy and numeracy. Children were eligible for participation if they (a) had a diagnosis of ASD from a pediatrician or psychologist; (b) had a receptive and expressive language disorder according

to results from standardized language assessments, (c) had English as their home language, (d) had speech intelligible to non-familiar listeners as judged by the first author, (e) were able to sit at a desk and participate in a structured class activity for 10 to 15 minutes, as reported by the classroom teachers and (f), did not include all of the following macrostructure elements in their original fictional narrative: *characters, setting, problem, feelings*, and what the character did to *fix* the problem.

The first author, also the school speech and language pathologist, conducted language assessments using the Clinical Evaluation of Language Fundamentals, Australian and New Zealand Standardised Edition, Fifth Edition (Wiig, Secord, & Semel, 2017), the Peabody Picture Vocabulary Test, Fourth Edition (Dunn & Dunn, 2007) and the Test of Narrative Language, Second Edition (Gillam & Pearson, 2017). The final inclusion criterion was assessed using a screener narrative collected from each participant prior to the research. The first author asked each participant to look at a picture depicting a problem (e.g., a bleeding knee) and then create a story. This narrative was collected in a quiet room with the participant sitting next to the first author. The participants' classroom teachers completed the Childhood Autism Rating Scale, Second Edition (Schopler, Van Bourgondien, & Love, 2010).

Assessment results are in Table 1.

(Insert Table 1)

Prior to the intervention the first author also conducted informal language assessments and observed the participants in the classroom and playground. All participants were able to talk about their holiday and all provided information about what they did. None of the participants provided evaluative information. The first sentence of Jem, Atticus and Dashiell's holiday narrative used correct grammar and word choice, but their narratives did not maintain coherence. Cooper was able to provide a narrative that included who, what, where and an evaluative statement using a previously taught and accurate sentence structure.

## Materials

The first author used a magnetic whiteboard (30 x 20cm), Picture Communication Symbols (Mayer-Johnson, 2008) representing each of the five macrostructure elements (icons cards), one probe stimulus picture and one intervention stimulus picture each session. The stimulus pictures contained situations to represent realistic problems that could likely be within the participants' experience or understanding (e.g., falling off a bike, running for the bus, a spider on a toilet roll). Where possible the pictures contained only the problem (e.g., broken window) but some pictures necessarily contained character and/or setting information (e.g., a dog leaving muddy footprints on a floor, handprints on a bedroom wall). Sixty-five stimulus pictures were sourced from Google images, printed in color and assigned a number. A random number generator (Random.org, n.d.) was used to select 35 narratives. Those 35 narratives were assigned as probe stimulus pictures and were not used in intervention. The remaining 30 pictures were used as intervention stimulus pictures. Generalization probes to fantasy-based original narratives were collected using one color picture showing an alligator walking down an internal staircase sourced from the children's picture book "There's an Alligator Under My Bed" (Mayer, 1987) and one picture of a dragon breathing fire onto a house sourced from Google images.

## Dependent Variable

The dependent variable was the macrostructure of original fictional narrative generated by each child. The five macrostructure elements used in the study were based on Stein and Glenn's (1978) macrostructure elements but were renamed as necessary to aid the participants' comprehension. The macrostructure of original fictional narrative was made up of *characters*, *setting* (where + activity), *problem*, *feeling about the problem* and *fix* (how was the problem resolved).



Based on evaluation of the entire narrative, the first author awarded each macrostructure element a score of 0, 1 or 2 according to a general scoring rubric (see Appendix A of this chapter). Two points were awarded if the information was explicit and the scorer did not require any shared knowledge, (e.g., riding his bike on the street), one point was awarded if some information was provided (e.g., riding), and no points were awarded if the participant did not provide information or the information did not relate to the stimulus materials. Responses of any length were acceptable, and the responses were not required to be grammatically correct.

### **Procedures**

In all probe and intervention sessions the participant sat next to the first author at a desk in a small room in the school. The whiteboard was on the desk in front of the participant. An iPhone was in an elevated position on the desk and was used to video record all probe and intervention sessions.

### **Probes**

Probes were collected weekly if the participant was not yet receiving intervention or four times a week if they were in true baseline or were receiving intervention. Participants were held in the baseline phase until the previous participant began to display an intervention effect. Five daily (true) baseline probes were collected, and monitored for stability, before the intervention phase began. When the participant entered the intervention phase the probes were conducted immediately before the intervention took place each session.

A single probe was conducted each session. The first author began video recording, greeted the participant, placed the probe stimulus picture on the whiteboard and secured it with a small magnet. The first author directed the participant to look at the picture if necessary and then asked them to make up a story about the picture. When the participant had

stopped talking for 3-5 seconds the first author thanked the participant but made no other comments.

After each session the video recordings were transferred to a computer and were transcribed verbatim by the first author, including fillers, false starts, repetitions, and idiosyncratic articulation. Any unintelligible speech was transcribed as UI. The narratives were coded from the transcriptions.

## **Intervention**

Intervention was implemented immediately after the probes were collected. Participants received four intervention sessions over three days each week. The intervention was designed so the participant would produce each macrostructure element independently and then say the entire narrative independently. The steps and key procedures of the intervention are outlined in Table 2.

(Insert Table 2)

To enable a gradual introduction to the task, sessions one and two of the intervention involved the first author modelling how to generate a narrative (intervention phase I). The first author informed the participant they would learn to make up stories and the first author would show the participant how to do it. The procedure described below was used but the first author provided the responses to the macrostructure element questions and asked the participant to repeat them, then modelled the entire narrative and asked them to repeat it. If the participant made any errors the first author modelled the correct answer but did not require them to repeat it.

After the initial phase I sessions phase II was implemented. The whiteboard remained on the desk during each teaching session and the first author stated that the participant was going to make up another story and that stories include special information. The first author secured the *characters* icon on the top left of the whiteboard and said that stories include

characters (e.g., “We name the characters or who is in the story.”). This procedure, with an explanation of each element, was repeated for the remaining icons. At the end of this stage the five icons were across the top of the whiteboard in the following order, *character, setting, problem, feelings, fix*.

The stimulus picture (e.g., plate of spaghetti fallen on the floor) was placed on the whiteboard under the icons and secured with a magnet. The participant was directed to look at the picture and the first author said that they were going to make up a story about the picture that included all the story parts, while simultaneously pointing to the five icons in the order they were introduced. The first author said that before they could make up the story with all the right parts, they needed to decide what the story would be about or what the problem in the story was. The first author then immediately elicited the problem from the participant (e.g., “Look at the picture and say what you think is the problem in the story.”). If the participant provided a response that was appropriate to the picture then the first author repeated the participant’s response and stated that they had given information about the problem in the story. If the participant made no response or an inappropriate response then the first author immediately modelled an appropriate answer and re-asked what the problem in the story could be. The first author then restated the response regardless of the participant response and stated that was the problem in this story. If the participant provided a partial response (e.g., “Spaghetti.” or “It’s a mess.”), the first author acknowledged the relevant ideas from the participant’s response with affirming feedback (e.g., “Yes, spaghetti.”) and then requested the student extend their response (e.g., “What happened to the spaghetti?”). If the participant provided a complete answer the first author treated it as a correct response. If they provided no further information, the first author provided an appropriate response (e.g., “The plate of spaghetti fell on the ground.”). The first author then re-asked what the problem

in the story was and then restated the appropriate response regardless of the participant response. The first author then said that is the problem in the story.

The first author then asked the participant to make up the whole story about the picture (e.g., “Now that we know the problem we can make up the whole story.”) and straight away elicited the *character* information (e.g., “Who are the characters in the story?”). If the participant provided an appropriate response (e.g., the character’s name) the first author repeated the participant’s response and stated that the participant had given information about the characters in the story. If the participant did not respond or provided an inappropriate response the first author modelled an appropriate answer (e.g., “Let’s call the character Rachel.”), reasked who the characters are in the story, allowed the participant time to respond then restated the appropriate response regardless of the participant response, stated that is the character in the story and then moved the character icon to the bottom of the board, under the stimulus picture. If the participant provided a partial response (e.g., “The girl.”, “Her.”) then the first author acknowledged the partial response and elicited further information (e.g., “Yes, it’s a girl, but let’s give her a name, what can we call her?”). The first author then stated the appropriate response regardless of the participant response, stated that is the character in the story and moved the character icon to the bottom of the board. If the participant provided a response from the previous day’s intervention session the first author stated that it was the same information as yesterday and asked for different information (e.g., “You said that yesterday, let’s give her a different name.”). The first author reasked who the character in the story could be, restated the appropriate response, stated that’s the character and moved the icon to the bottom of the board.

The remaining four macrostructure elements were elicited using the same procedure. At the end of this stage of the intervention all five macrostructure icons were across the bottom on the board in the following order, *characters*, *setting*, *problem*, *feeling*, *fix*.

When all macrostructure elements had been elicited separately, the first author then asked the participant to tell the whole narrative (e.g., “Now tell me the whole story using the information you just told me.”) and pointed to the character icon as a cue to begin. If the participant omitted any information, made any alterations or provided different information the first author provided correct information immediately and pointed to the next icon. The first author then modelled the whole narrative, using the same information as elicited in the individual elements stage and correct grammar. If the participant made an error during the first opportunity to say the whole narrative a second opportunity was provided for the participant to say the entire narrative again. The first author then removed the icons and told the participant that they could say the narrative without the cards (e.g., “I’m taking the cards away now, you can tell me the story without the cards.”). If the participant omitted or altered any information the first author provided the correct information and moved on. The first author stated that the session was finished.

Several changes to the intervention were implemented for Dashiell and Cooper. A summary of these changes is in Table 3.

(insert table 3)

### **Maintenance and Generalization Probes**

Maintenance and generalization probes were collected for all participants using the same conditions as the baseline and intervention probes. Generalization probes were collected using the same procedure but with fantasy stimulus pictures. Generalization probes were collected from all four participants in the baseline phase, additional probes were collected from Atticus and Dashiell during late intervention and maintenance, from Jem during late intervention and from Cooper during the maintenance phase.

### **Coding Reliability**

For training purposes the second and third authors were provided a copy of the scoring rubric and transcripts of four training narratives to code. Disagreements were discussed. Subsequently, the second or third authors independently coded 20% of probe narrative transcripts for each participant, which were selected using a random number generator. The second and third authors were blind to whether the transcripts examined were from baseline or intervention. Reliability was calculated by dividing agreements by agreements plus disagreements. Mean overall reliability across all participants was 87% (range 80-96%). Mean reliability for Jem was 80% (range 60-100); Atticus 96% (range 90-100%); Dashiell 80% (range (60-100%)) and for Cooper 90% (range 60-100). Coding for each participant was across five macrostructure elements, disagreements on two elements reduced coding reliability to 60% for three transcripts. Mean reliability across each macrostructure element across all participants and sessions was; character 89%; setting 85%; problem 81%; feelings 93%; fix 85%. Given that the total macrostructure score was the dependent variable, a Pearson correlation was calculated between pairs of scores, resulting in a correlation of 0.94, indicating reliability of the total scores was very high between the coders.

### **Procedural Reliability**

A research assistant was trained to evaluate procedural reliability. A checklist was discussed with the research assistant and the first author and the assistant then watched one intervention session and rated it together. Each step on the procedural reliability checklist was scored as being correctly or incorrectly completed and steps that were not required (e.g., error correction if no errors were made) were marked as N/A and not included in final scores. The research assistant then independently rated a further two sessions. Any questions were discussed. Following training, the research assistant conducted procedural reliability coding on 20% of intervention sessions for each participant, which were selected using a random

number generator, random.org (Random.org, n.d.). Overall procedural reliability was 94% (range 84-99%).

### **Social Validity**

A school administrative employee, who was experienced with communicating with children with disordered language but naive to the research, completed two measures of social validity. The employee was provided with six randomly selected narrative transcriptions including three from baseline and three from late intervention for each child. The transcriptions were presented in random order. She was first asked to rank the narratives in order of quality from 1 to 6 (1 = best), and then to rate each narrative on a 1 to 5 scale (1 = very good, 2 = good, 3 = okay, 4 = poor, 5 = very poor).

### **Results**

Figure 1 shows the effect of the narrative intervention on the macrostructure of original fictional narratives for each participant. An intervention effect was demonstrated for Jem, Atticus and Dashiell and those participants displayed maintenance and generalization of the skill to fantasy-based original fictional narratives.

Jem received 14 intervention sessions and approximately 80 minutes of intervention. Intervention sessions ranged between 5 minutes and 7 minutes in length. Examination of the figure shows a clear intervention effect. Jem's scores initially dropped below baseline performance after intervention began, but he showed a rapid increase after four sessions and his scores stabilized between seven and ten. Three maintenance probes were collected up to six weeks after intervention had ceased and, although his scores were variable, the majority were well above baseline. Two sets of two generalization probes were collected. Baseline generalization scores were low, and he achieved the maximum score on both probes collected on the final day of intervention.

Dashiell received 26 sessions and approximately 167 minutes of intervention. Sessions ranged between 5 and 10 minutes in length. Examination of the graphs indicates an intervention effect, albeit after program changes were implemented. Although his baseline scores were variable his true baseline scores stabilized. His scores ranged between zero and four over the first ten intervention sessions and then increased noticeably in the final two intervention phases. One maintenance score was collected 12 weeks after intervention ceased. Three sets of generalization scores were collected. Generalization probes conducted during baseline were low, late intervention probe scores were variable, one low and the other a maximum score, and maintenance probe scores were both above baseline.

Atticus received nine intervention sessions and approximately 32 minutes of intervention. Intervention sessions ranged between 2 and 6 minutes in length. Examination of the graphs indicates a clear intervention and maintenance effect and generalization to fantasy-based narratives was observed.

Cooper received 25 intervention sessions and approximately 120 minutes of intervention. Sessions ranged between 2 and 10 minutes in length. An intervention effect cannot be asserted for Cooper as seven phase changes were implemented, and his intervention scores did not consistently increase. On two occasions in intervention Phase 6 he was able to generate a complete narrative using previously unseen picture stimuli. Although there was some improvement in his scores, a decision was made to stop intervention as it was the end of the school term. His maintenance and generalization scores did increase in the maintenance phase.

The first social validity task was assessed by asking the observer to rank six narratives (three from baseline and three from intervention) from each participant in order from 1 (best narrative) to 6. Intervention narratives were ranked at position 1 and 2 for all participants, for two participants the final intervention narrative was ranked at position 3, for one participant



the final intervention narrative was ranked at position 4 and for one participant the final intervention narrative was ranked at position 5. The second social validity task required the observer to rate the same narratives for each participant on a scale of 1 (very good) to 5 (very poor). Overall the intervention narratives were more highly rated. The average rating for each participant was as follows, Jem baseline 2.7, intervention 1.3; Dashiell baseline 2.7, intervention 2; Atticus baseline 4.3, intervention 2; Cooper baseline 4, intervention 3.

## **Discussion**

The purpose of this study was to investigate the effects of an oral narrative intervention on the fictional narrative generations of four children with a diagnosis of ASD and co-occurring language disorder. The study supports previous research on oral narrative intervention in children with ASD (Gillam et al., 2015; Favot et al., 2018b; Favot et al., 2018b; Petersen et al., 2014) as an experimental effect and maintenance effects were demonstrated for three of the four participants. The current study extends the research of Gillam et al. (2015) and Petersen et al. (2014) as measures of generalization were included. The results of this study are in keeping with previous oral narrative interventions that have used icons, pictures to represent narratives, modelling and the participant telling the entire narrative each session (see Favot et al., 2018b; see Favot et al., 2018b; see Petersen et al., 2014). These results are also consistent with those of Gillam et al. (2015) in that the macrostructure based oral narrative intervention appeared to be an appropriate intervention to develop original fictional narratives for children with language disorder.

The study reported here extends the study conducted by Gillam et al. (2015) in a number of ways. Firstly, the intervention was brief, with participants receiving between 32 and 167 minutes of intervention, compared to 17.5 to 27.5 hours in Gillam et al. (2015). Secondly, three of the four participants generalized the taught skills to fantasy-based original fictional narratives, whereas Gillam et al. did not include generalization measures. The

fantasy-based narratives used in this study to assess generalization, tested participants' skills to a greater extent than the daily probes, as they required an application of the learned skill to situations outside of their experience and not based in reality. Lastly the daily probes were collected before the daily intervention, whereas Gillam et al. collected probe data after intervention sessions. Probe data collected after an intervention session may be influenced by the preceding intervention session while data collected beforehand may better assess participant mastery of targeted skills (Alberto & Troutman, 2009).

As with previous similar interventions (see Favot et al., 2018b), amendments were made to the intervention procedure as two participants were not making adequate progress. Single case research designs are well suited to interventions with idiosyncratic populations as they allow for modifications to be made to the procedure if the intervention is not working (Rapoff & Stark, 2008). Modifications to intervention may be necessary when working with individuals with ASD as no single intervention works with all individuals with ASD (Layne, 2007; Lindgren & Doobay, 2011). Amendments in the current study were designed to increase intervention intensity, to reduce the amount of verbal prompting and for Dashiell to highlight missing macrostructure elements. Increasing intensity and reducing verbal prompts was sufficient for Dashiell's scores to increase but not for Cooper.

Assessments completed prior to this study to assess Cooper's eligibility do not provide any obvious insight as to why he was not responsive to this intervention. There are a number of other possible explanations for his lack of progress. Firstly, even though a probe variation of the multiple baseline design was employed, it is possible that the extended period on baseline, during which time his narratives were not developed, and he was explicitly thanked for each narrative he produced, could have reinforced his minimal responses to the stimulus materials and the standardized verbal prompt. Secondly it is possible that even though he learned to generate narratives in the intervention sessions, he "stipulated" (Engelmann &

Carnine, 2016) this behavior to the intervention condition and did not generalize to the range of possibilities to which the skill could apply. This could possibly be addressed by varying the verbal prompts used to elicit the probe and intervention narratives, by explicitly stating that he could make up a story at any time.

### **Limitations**

The results described in this paper should be interpreted with caution. The intervention was conducted with a small number of participants, using a single subject methodology which has limited external validity. A further limitation to this study is that generalization was only examined in relation to fantasy-based narratives.

### **Implications for Practice and Future Research**

The outcomes of this intervention study indicate that the intervention may be effective, and it has further reinforced the value of previous interventions that have used similar approaches. Future research in the area could be extended in several ways. Researchers in future studies could also investigate the efficacy of intervention with children ASD and co-occurring language disorder in small groups in either clinic or classroom settings. The highly structured, semi-scripted intervention could be adapted to be delivered in small groups in school settings by classroom teachers. Researchers have demonstrated an intervention effect when delivering a similar intervention to students in small groups (see Spencer, Weddle, Petersen, & Adams, 2017). Researchers could also investigate how to develop the complexity of the narratives produced by children by exploring the development of intervention sequences aimed at moving from simple original fictional narrative to original fictional narratives with more complex macrostructure.

### **Conclusion**

The effects of a brief explicit oral narrative intervention on the original fictional narratives of four participants with ASD and co-occurring language disorder are described.

There was a strong intervention effect for two participants and a moderate intervention effect for one participant. Amendments were made to the intervention for two participants indicating the advantages of single case research with individuals with ASD and co-occurring language disorder. The taught skills were maintained for three participants with evidence of generalization to fantasy -based fictional narratives. The results of this research indicate that a short fictional narrative intervention can be effective for children with ASD and co-occurring language disorders. Areas for future research could include measuring the effect of intervention within a small group setting and transferring the effect with simple macrostructure to more complex macrostructure.

### **Compliance with Ethical Standards**

All authors have contributed to, seen and approved of the manuscript and agree to the order of the authors as listed on the title page.

**Ethical approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and / national research committee and with the 1964 Helsinki declaration and its later amendments of comparable ethical standards.

**Informed consent:** Informed consent was obtained from parents of all individual participants included in the study.

**Disclosure of potential conflicts of interests:** The authors declare that they have no conflict of interest.

**Funding:** No grants or any other financial support was received for this paper.

## Reference List

- Alberto, P. A., & Troutman, A. C. (2009). *Applied behavior analysis for teachers* (8th ed.). Upper Saddle River, NJ: Pearson.
- Allen, M. S., Kertoy, M. K., Sherblom, J. C., & Pettit, J. M. (1994). Children's narrative productions: A comparison of personal event and fictional stories. *Applied Psycholinguistics*, 15, 149-176. doi:10.1017/S0142716400005300
- Australian Curriculum, Assessment and Reporting Authority [ACARA]. (2016). Australian Curriculum: English. Retrieved from <https://www.australiancurriculum.edu.au/f-10-curriculum/english/?layout=1#cdcode=ACELA1428&level=F>
- Baixauli, I., Colomer, C., Roselló, B., & Miranda, A. (2016). Narratives of children with high-functioning autism spectrum disorder: A meta-analysis. *Research in Developmental Disabilities*, 59, 234-254. doi:10.1016/j.ridd.2016.09.007
- Benson, M. S. (1993). The structure of four-and five-year-olds' narratives in pretend play and storytelling. *First Language*, 13, 203-223. doi:10.1177/014272379301303803
- Bishop, D. V. M., & Edmundson, A. (1987). Language-impaired 4-year-olds distinguishing transient from persistent impairment. *Journal of Speech and Hearing Disorders*, 52, 156-173. doi:10.1044/jshd.5202.156
- Caldwell, D., & White, P. R. R. (2017). That's not a narrative; this is a narrative: NAPLAN and pedagogies of storytelling. *Australian Journal of Language and Literacy*, 40, 16-27.
- Cheshire, J. (2000). The telling or the tale? Narratives and gender in adolescent friendship networks. *Journal of Sociolinguistics*, 4, 234-262. doi:10.1111/1467-9481.00113
- Department of Education. (2014). National curriculum in England: English programmes of study. Retrieved from <https://www.gov.uk/government/publications/national->

curriculum-in-england-english-programmes-of-study/national-curriculum-in-england-english-programmes-of-study

Dunn, L. M., & Dunn, D. M. (2007). *Peabody Picture Vocabulary Test: Fourth Edition (PPVT-4) [Assessment Instrument]*. Minneapolis, MN: Pearson Assessments.

Engel, S. (1995). *The stories children tell: Making sense of the narratives of childhood*. New York, N.Y: W.H. Freeman.

Engelmann, S., & Carnine, D. (2016). *Theory of instruction: Principles and applications*. Eugene, OR: NIFDI Press. Retrieved from [https://www.researchgate.net/publication/303721842\\_Theory\\_of\\_Instruction\\_Principles\\_and\\_Applications](https://www.researchgate.net/publication/303721842_Theory_of_Instruction_Principles_and_Applications)

Favot, K., Carter, M., & Stephenson, J. (2018b). The effects of an oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment: A pilot study. *Journal of Developmental and Physical Disabilities, 30*, 615-637. doi:10.1007/s10882-018-9608-y

Favot, K., Carter, M., & Stephenson, J. (2018b). The effects of oral narrative intervention on the personal narratives of children with ASD and severe language impairment: A pilot study. *International Journal of Disability, Development and Education, 1*-18. doi:10.1080/1034912x.2018.1453049

Feagans, L., & Appelbaum, M. I. (1986). Validation of language subtypes in learning disabled children. *Journal of Educational Psychology, 78*, 358-364. doi:10.1037/0022-0663.78.5.358

Finestack, L. H. (2012). Five principles to consider when providing narrative language intervention to children and adolescents with developmental disabilities. *Perspectives on Language Learning and Education, 19*, 147-154. doi:10.1044/llc19.4.147

- Gillam, R. B., & Pearson, N. A. (2017). *Test of Narrative Language: Second Edition (TNL-2) [Assessment Instrument]*. Austin, TX: Pro- ed.
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech Language and Hearing Research*, 58, 920-933. doi:10.1044/2015\_JSLHR-L-14-0295
- Hedberg, N. L., & Westby, C. E. (1993). *Analyzing storytelling skills: Theory to practice*. Tuscon, AZ: The Psychological Corporation.
- Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. *Journal of Applied Behavior Analysis*, 11, 189-196.
- Hudson, J., & Shapiro, L. (1991). From knowing to telling: The development of children's scripts, stories and personal narrative. In A. McCabe & C. Peterson (Eds.), *Developing narrative structure* (pp. 89-136). Hillsdale, NJ: Erlbaum.
- Hughes, D. L., McGillivray, L., & Schmidek, M. (1997). *Guide to narrative language: Procedures for assessment*. Eau Claire, WI: Thinking Publications.
- Johnston, J. R. (2008). Narratives: Twenty-five years later. *Topics in Language Disorders*, 28, 93-98. doi:10.1097/01.TLD.0000318931.08807.01
- Justice, L. M., Bowles, R. P., Kaderavek, J. N., Ukrainetz, T. A., Eisenberg, S. L., & Gillam, R. B. (2006). The index of narrative microstructure: A clinical tool for analyzing school-age children's narrative performances. *American Journal of Speech-Language Pathology*, 15, 177-191. Retrieved from <http://ajslp.pubs.asha.org/article.aspx?articleid=1757624&resultclick=1>
- Kaderavek, J. (2015). *Language disorders in children: Fundamental concepts of assessment and intervention* (2nd ed.). Boston, MA: Pearson.

- King, D., Dockrell, J., & Stuart, M. (2014). Constructing fictional stories: A study of story narratives by children with autistic spectrum disorder. *Research in Developmental Disabilities, 35*, 2438-2449. doi:10.1016/j.ridd.2014.06.015
- Layne, C. M. (2007). Early identification of autism: Implications for counselors. *Journal of Counseling and Development, 85*, 110-114. doi:10.1002/j.1556-6678.2007.tb00452.x
- Lindgren, S., & Doobay, A. (2011). *Evidence based interventions for autism spectrum disorders*. University of Iowa.
- Losh, M., & Capps, L. (2003). Narrative ability in high-functioning children with autism or Asperger's syndrome. *Journal of Autism and Developmental Disorders, 33*, 239-251. doi:10.1023/A:1024446215446
- Mayer-Johnson. (2008). *Boardmaker ®(Version 6) [Computer software]*. Solana Beach, CA: Mayer-Johnson.
- Mayer, M. (1987). *There's an alligator under my bed*. New York, NY: Penguin.
- McCabe, A. (1991). Preface: Structure as a way of understanding. In A. McCabe & C. Peterson (Eds.), *Developing narrative structure* (pp. X-XVII). Hillsdale, N.J.: Lawrence Erlbaum Associates.
- McCabe, A., Bliss, L., Barra, G., & Bennett, M. (2008). Comparison of personal versus fictional narratives of children with language impairment. *American Journal of Speech-Language Pathology, 17*, 194-206. doi:10.1044/1058-0360(2008/019)
- Morrow, L. M. (1985). Retelling stories: A strategy for improving young children's comprehension, concept of story structure, and oral language complexity. *The Elementary School Journal, 85*, 647-661. doi:10.1086/461427
- National Governors Association Center for Best Practices and Council of Chief State School Officers. (2010). Common core standards. Retrieved from <http://www.corestandards.org>



- Norbury, C. F., & Bishop, D. V. (2003). Narrative skills of children with communication impairments. *International Journal of Language and Communication Disorders*, 38, 287-313. doi:10.1080/136820310000108133
- Owens, R. E. (2016). *Language development: An introduction* (9th ed.). Upper Saddle River, NJ: Pearson.
- Paley, V. G. (1990). *The boy who would be a helicopter*. Cambridge, MA: Harvard University Press.
- Petersen, D. B. (2011). A systematic review of narrative-based language intervention with children who have language impairment. *Communication Disorders Quarterly*, 32, 207-220. doi:10.1177/1525740109353937
- Petersen, D. B., Brown, C. L., Ukrainetz, T. A., Wise, C., Spencer, T. D., & Zebre, J. (2014). Systematic individualized narrative language intervention on the personal narratives of children with autism. *Language, Speech, and Hearing Services in Schools*, 45, 67-86. doi:10.1044/2013\_LSHSS-12-0099
- Petersen, D. B., Gillam, S. L., Spencer, T., & Gillam, R. B. (2010). The effects of literate narrative intervention on children with neurologically based language impairments: An early stage study. *Journal of Speech, Language, and Hearing Research*, 53, 961-981. doi:10.1044/1092-4388(2009/09-0001)
- Random.org. (n.d.). True random number generator. Retrieved from <https://www.random.org>
- Rapoff, M., & Stark, L. (2008). Editorial: Section on Single-Subject Studies. *Journal of Pediatric Psychology*, 33, 16-21. doi:10.1093/jpepsy/jsm101
- Reese, E., & Newcombe, R. (2007). Training mothers in elaborative reminiscing enhances children's autobiographical memory and narrative. *Child Development*, 78, 1153-1170. doi:10.1111/j.1467-8624.2007.01058.x

- Rollins, P. (2014). Personal narratives in individuals with high-functioning ASD: A lens Into social skills. *SIG 1 Perspectives on Language Learning and Education*.  
doi:10.1044/lle21.1.13
- Schopler, E., Van Bourgondien, M. E., & Love, S. R. (2010). *Childhood Autism Rating Scale, Second Edition (CARS-2) [Assessment Instrument]*. Los Angeles, CA: Western Psychological Services.
- Semel, E. M., Wiig, E. H., & Secord, W. (2003). *Clinical Evaluation of Language Fundamentals: Fourth Edition [Assessment Instrument]*. Toronto, ON, Canada: The Psychological Corporation.
- Spencer, T. D., Kajian, M., Petersen, D. B., & Bilyk, N. (2013). Effects of an individualized narrative intervention on children's storytelling and comprehension skills. *Journal of Early Intervention, 35*, 243-269. doi:10.1177/1053815114540002
- Spencer, T. D., & Petersen, D. B. (2018). Bridging oral and written language: An oral narrative language intervention study with writing outcomes. *Language Speech and Hearing Services in Schools, in press*, 1. doi:10.1044/2018\_lshss-17-0030
- Spencer, T. D., Weddle, S. A., Petersen, D. B., & Adams, J. L. (2017). Multi-tiered narrative intervention for preschoolers: A Head Start implementation study. *NHSA Dialog, 20*. Retrieved from <https://journals.uncc.edu/dialog/article/download/543/689>
- Sperry, L. L., & Sperry, D. E. (1996). Early development of narrative skills. *Cognitive Development, 11*, 443-465. doi:10.1016/S0885-2014(96)90013-1
- Stein, N. L., & Glenn, C. G. (1978). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), *New directions in discourse processing* (pp. 53 - 120). Norwood, NJ: Ablex Publishing Corporation.
- Stirling, L., Douglas, S., Leekam, S., Carey, L., Arciuli, J., & Brock, J. (2014). The use of narrative in studying communication in autism spectrum disorders. In *Communication*

*in autism, trends in language acquisition research* (pp. 169-216). Amsterdam, The Netherlands: John Benjamins Publishing Company. Retrieved from [http://books.google.com/books?hl=en&lr=&id=K\\_XEBAAAQBAJ&oi=fnd&pg=PA171&dq=the+use+of+narrative+Stirling&ots=Otrqi8ldfs&sig=nMbr6U-nySq6cLTGf0eHjGZ9aS8](http://books.google.com/books?hl=en&lr=&id=K_XEBAAAQBAJ&oi=fnd&pg=PA171&dq=the+use+of+narrative+Stirling&ots=Otrqi8ldfs&sig=nMbr6U-nySq6cLTGf0eHjGZ9aS8)

Westby, C. (1991). Learning to talk, talking to learn: Oral literate language differences. In C. S. Simon (Ed.), *Communication skills and classroom success* (pp. 334-357). Eau Claire, WI: Thinking Publications.

Westerveld, M. F., & Gillon, G. T. (2010). Oral narrative context effects on poor readers' spoken language performance: Story retelling, story generation, and personal narratives. *International Journal of Speech-Language Pathology*, 12, 132-141.  
doi:10.3109/17549500903414440

Wiig, E. H., Secord, W. A., & Semel, E. (2017). *Clinical Evaluation of Language Fundamentals: Fifth Edition, Australian and New Zealand Standardised Edition (CELF-5 A&NZ) [Assessment Instrument]*. Sydney, Australia: Pearson Clinical Assessment.

Table 1

*Participant description*

Name	Age (years; months)	Diagnosis	Adaptive behavior	IQ	CELF-5		PPVT-4	TNL-2 Production	CARS-2	Macrostructure components in narrative screener
					Receptive	Expressive				
Jem	9;6	ASD (DSM 5)	Not available	Not available	SS 78 Mild difficulties	SS 73 Moderate difficulties	SS 92 Low average	SS 2 Very poor	30 mild to moderate symptoms	Problem, solution
Cooper	9;4	ASD (DSM 5)	Social and practical below average, communication low (ABAS-3)	Verbal IQ very low range (WISC V)	SS 69 very low range	SS 63 very low range	SS 79 Moderately low	SS 2 Very Poor	33.5 mild to moderate symptoms	Problem, partial reference to characters
Atticus	9;4	ASD (DSM 5)	Low (ABAS-3)	Verbal 63- 73 delayed mildly (SB-5)	SS 91 average	SS 70 very low range	SS 90 Low average	SS 4 Poor	32 mild to moderate symptoms	Problem, partial reference to character
Dashiell	10;2	ASD (DSM 5)	Not available	Not available	SS 67 very low range	SS 59 very low range	SS 81 Moderately low	SS 1 Very poor	32 mild to moderate symptoms	Problem

*Note.* DSM 5 = Diagnostic and statistical manual of mental disorders (American Psychiatric Association, 2013); ABAS-3 = Adaptive Behavior Assessment System, Third Edition (Harrison & Oakland, 2015); SB-5 = Stanford-Binet Intelligence Scale, Fifth Edition (Roid, 2003); WISC V = Wechsler Intelligence Scales for Children, Fifth Edition (Wechsler, 2016); CELF-5 = Clinical Evaluation of Language Fundamentals, Fifth Edition Australian and New Zealand Standardised Edition (Wiig, Secord, & Semel, 2017); PPVT-4 = Peabody Picture Vocabulary Test, Fourth Edition (Dunn & Dunn, 2007); TNL-2 = Test of Narrative Language, Second Edition (Gillam & Pearson, 2017); CARS-2 = Childhood Autism Rating Scales, Second Edition (Schopler, Van Bourgondien, & Love, 2010); SS = standard score

Table 2

*Steps and Key Procedures of Original Fictional Narrative Intervention*

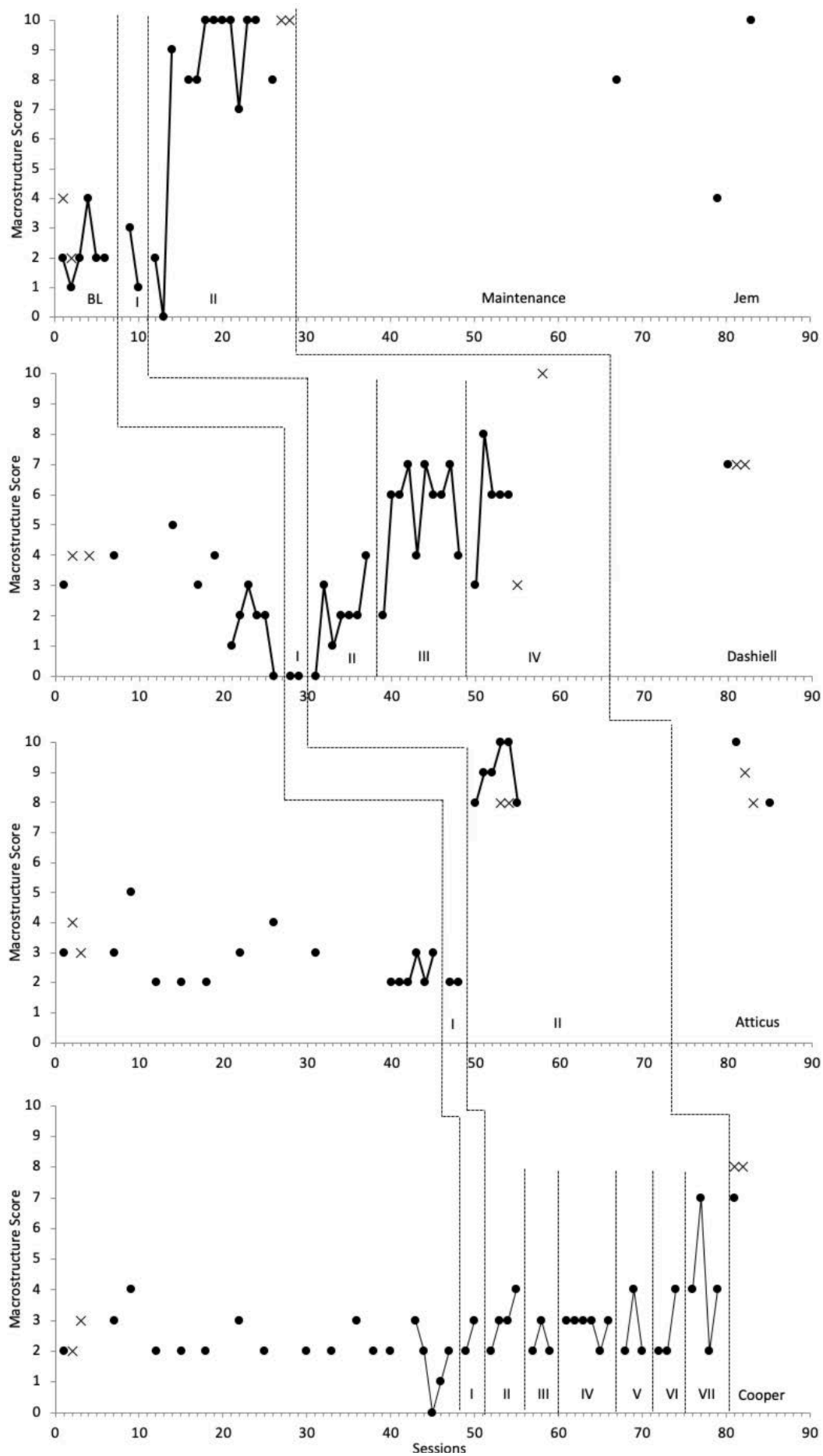
Step	Key Procedures
1. Introduction to macrostructure elements	<ul style="list-style-type: none"> <li>• Name and explain 5 macrostructure elements</li> <li>• Place icons across top of board</li> </ul>
2. Establish the <i>problem</i> in the narrative	<ul style="list-style-type: none"> <li>• State that before participant can generate a story they need to know what the problem will be</li> <li>• Elicit <i>problem</i> based on picture</li> <li>• Error correction and or extension as required</li> <li>• Repetition and modelling of correct information</li> </ul>
3. Elicit 5 macrostructure elements separately	<ul style="list-style-type: none"> <li>• Elicit each macrostructure element</li> <li>• Further questioning as necessary to elicit full response for each element</li> <li>• Model response back to participant</li> <li>• State name of element and move icon to bottom of board</li> </ul>
4. State whole narrative	<ul style="list-style-type: none"> <li>• Participant says entire narrative</li> <li>• Error correction as necessary (based on information in elicitation stage)</li> <li>• First author models narrative</li> <li>• Second opportunity for participant to say narrative if errors in first opportunity and error correction as necessary</li> <li>• Remove the icons and provide another opportunity to state the narrative</li> </ul>

Table 3

*Changes to intervention procedure for Dashiell and Cooper*

Dashiell				Cooper			
Phase no.	Session no.	Description of change	Rationale	Phase no.	Session no.	Description of change	Rationale
3	20	1 <sup>st</sup> intervention narrative as outlined, + 2 <sup>nd</sup> intervention narrative (picture + icons on board)	Performing within baseline range	3	6	As for Dashiell phase 3.	Performing within baseline range
		<ul style="list-style-type: none"> <li>request entire narrative (no other prompts)</li> <li>prompt for missing macrostructure elements</li> <li>request then model entire narrative</li> <li>remove icons and request entire narrative</li> </ul>		4	9	As for phase 3 but no icons in 2 <sup>nd</sup> intervention narrative	Able to produce complete narrative with minimal prompting in intervention but no transfer to probe
4	30	Up to 3 intervention narratives per session	Scores increased but not to maximum, and scores in “character” and “feelings” were low	5	15	As for phase change 4 but removed initial intervention narrative, and increased intensity to 3 or 4 narratives per session	As above
		<ul style="list-style-type: none"> <li>picture only</li> <li>request entire narrative, remind to name character and feelings</li> </ul>		6	18	As above but intervention pictures previously unseen	As above
				7	22	Probe condition change – prompt him for macrostructure elements, request probe narrative, intervention as phase 6	As above

*Figure 1.* Original fictional narrative macrostructure score. Roman numerals denote intervention phase; X = generalization probe.





## Appendix A

Macrostructure Element	2 points	1 point	0
	Scorer should not need shared knowledge to understand the information	Key words or phrases, but not specific or clear, may be attributed to the wrong person	No information or incorrect information
<b>Character</b>	Main character's name	Broad character description (e.g., the boy, the brother)	Pronouns, someone
<b>Setting</b>	Activity and the location (e.g., eating pizza in the kitchen), "home" acceptable if story makes sense	Activity or location (e.g., say "home" or "eating pizza")	No information or incorrect information
<b>Problem</b>	Statement of what went wrong in the story	Incomplete, not clear, uses vague vocabulary	No information or incorrect information
<b>Feelings about the problem</b>	Specific appropriate emotion	Emotion named but may be inappropriate, or general behavior related to the problem (e.g., "didn't like it)	No information or incorrect information
<b>Fix</b>	Specific information that states what characters (main or secondary) did to fix the problem, can use dialogue or description, may assume the voice of the character	Broad description of what was done (e.g., asked for help, X helped Y), correct actions but attributed to the wrong people or it's unclear	No information or incorrect information

## **CHAPTER 6: SUMMARY AND CONCLUSION**

### **Chapter Overview**

Chapter 6 is a summary of the research contained in this thesis and the major conclusions that can be drawn from it. The major contributions of this research are also identified.

### **Summary of Research**

The aim of this research was to (a) evaluate current research on oral narrative intervention in children with language disorder and (b) investigate the effect of oral narrative intervention on the oral narratives of children with autism spectrum disorder (ASD) and language disorder. Research questions were proposed to establish the state of the existing research and the effect of narrative intervention on different classes of narrative with children with ASD and language disorder.

In chapter 1, discussions of core terminology and theories relevant to this thesis were offered, along with a chapter overview and research questions. In chapter 2 a systematic literature review was presented. The literature review provided an evaluation of the quality of the existing research and established the efficacy and common features of the interventions. Interrater reliability was conducted for all data extraction in accordance with recommendations for conducting a methodologically sound systematic literature review (Schlosser, Wendt, & Sigafoos, 2007). The review included extensive evaluations of research quality. Interrater reliability was conducted on all extracted data. Overall, the single case research studies were of high quality. The quality of the group studies was lower, and only four included comparison groups. Single case research for macrostructure measures were moderate with lower effect sizes for microstructure. The effect sizes for group studies were inconsistent. Interventions that were able to show effects typically included icons to represent macrostructural elements, pictures to illustrate individual narratives, clinician modelling of

narrative and the participants being provided an opportunity to tell an entire narrative each intervention session. It was recommended that future research into oral narrative intervention with children with language disorder should use more robust research designs, include delivery to participants in group settings and include participants with a wider range of disabilities. Future research should include examination of generalisation and the effect of intervention on personal narrative generation. This review offered the most comprehensive analysis of the effect of oral narrative interventions to date.

The four intervention papers presented in this thesis contribute to the small but developing body of research that investigates the use of oral narrative intervention in children with ASD and language disorder. Chapter three included a published manuscript “The effects of oral narrative intervention on the personal narratives of children with ASD and severe language disorder” which is one of the first investigations into the effect of intervention on personal narratives. Intervention and maintenance effects were demonstrated for three of the four participants. It is the first to include extensive measures of generalisation and one participant demonstrated some evidence of generalisation across settings, people and stimuli.

Chapter four contained a published manuscript examining the effects of oral narrative intervention on the fictional narrative retells of children with ASD and severe language impairment. Intervention and maintenance effects were demonstrated for three of four participants. Generalisation to storybooks typical of classroom use did not occur. This was the first investigation into the effect of intervention on fictional narrative retells.

Two manuscripts are presented in chapter five. The first, a published manuscript was a pilot study of a brief intervention to teach original fictional narratives to a child with ASD and language disorder. This was conducted to establish the feasibility and efficacy of a brief intervention procedure. The intervention was found to be feasible, and the single participant increased macrostructural element use post intervention. The second paper examined the

effects of an oral narrative intervention on the original fictional narratives of four children with ASD and language disorder. An intervention effect, maintenance and generalisation were demonstrated for three of the four participants. This paper represents one of the first to investigate the effects of intervention on original fictional narratives in children with ASD and language disorder.

Overall, the four intervention papers presented provide evidence that oral narrative interventions are likely to be effective in teaching children with ASD and language disorder to generate personal narrative, fictional narrative retells and original fictional narrative. The outcomes provide additional evidence that a small corpus of materials and strategies may be effective when teaching children with ASD and language disorder to generate narratives.

Across the three major intervention studies no single intervention was effective with all participants and adjustments were required to the intervention procedures. Amendments were implemented for specific participants and included increasing the number of narratives that participants produced in each intervention session, explicit teaching of macrostructural elements that a participant was not including in their narratives and reducing verbal prompting. Given the idiosyncratic responses of learners across these studies, clinicians would be well advised to carefully monitor participant progress and make adjustments to intervention based on these data.

All studies presented in this thesis included investigation of generalisation measures, a feature that has not been commonly present in previous research. Individuals with ASD often have difficulties with generalising learned skills to novel situations (Koegel, Koegel, & McNerney, 2001). If language skills do not generalise to untrained stimuli, however, they are unlikely to be applied in a functional way in daily life (Wolfe, Blankenship, & Rispoli, 2018). Some evidence of generalisation of personal narratives was found across people, settings and materials. Generalisation was observed from generating an original narrative based on a

realistic scenario to producing an original narrative based on a fantastical scenario.

Generalisation was not demonstrated, however, from being able to retell a purpose written narrative to retell of a storybook as typically used in the classroom. Thus, results were inconsistent, highlighting the need to more carefully examine generalisation and investigate strategies that might support generalisation of the taught skill.

A number of features of the research studies described in this thesis offer insights into the social validity and practical applicability of the interventions described. The intervention sessions were brief, ranging between one and 10 minutes in length and overall intervention time for individual participants ranged between 32 minutes and five hours. Both the length of sessions and total duration of intervention was considerably less than that reported in many previous studies (Gillam, Hartzheim, Studenka, Simonsmeier, & Gillam, 2015; Gillam et al., 2018; Klecan-Aker & Gill, 2005), notwithstanding the level of disability of the participants. This testifies to the potential classroom application of the techniques. In addition, implementation of some of the intervention in the personal narrative intervention was conducted by the participants' classroom teacher. Ease of adaptation of research to the classroom is important in the research to practise framework (Brown, Garzarek, & Donegan, 2014). While further research is required, the high rates of procedural reliability achieved by the classroom teacher indicate that the short semi-scripted intervention sessions described in this thesis are able to be implemented by classroom staff.

### Summary

This chapter provided a summary of the research presented in this thesis and the major conclusions that can be drawn from the research. The original contributions of this research to the field of language intervention are identified. The research presented in this thesis contributes to the small body of research related to oral narrative intervention in children with autism spectrum disorder and language disorder.

## References

- Brown, J. A., Garzarek, J. E., & Donegan, K. L. (2014). Effects of a narrative intervention on story retelling in at-risk young children. *Topics in Early Childhood Special Education, 34*, 154-164. doi:10.1177/0271121414536447
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech Language and Hearing Research, 58*, 920-933. doi:10.1044/2015\_JSLHR-L-14-0295
- Gillam, S. L., Olszewski, A., Squires, K., Wolfe, K., Slocum, T., & Gillam, R. B. (2018). Improving narrative production in children with language disorders: An early-stage efficacy study of a narrative intervention program. *Language Speech and Hearing Services in Schools, 49*, 197-212. doi:10.1044/2017\_LSHSS-17-0047
- Klecan-Aker, J. S., & Gill, C. (2005). Teaching language organization to a child with pervasive developmental disorder: A case study. *Child Language Teaching and Therapy, 21*, 60-74. doi:10.1191/0265659005ct281oa
- Koegel, R. L., Koegel, L. K., & McNerney, E. K. (2001). Pivotal areas in intervention for autism. *Journal of Clinical Child & Adolescent Psychology, 30*, 19-32. doi:10.1207/s15374424jccp3001\_4
- Schlosser, R. W., Wendt, O., & Sigafoos, J. (2007). Not all systematic reviews are created equal: Considerations for appraisal. *Evidence-Based Communication Assessment and Intervention, 1*, 138-150. doi:10.1080/17489530701560831
- Wolfe, K., Blankenship, A., & Rispoli, M. (2018). Generalization of skills acquired in language for learning by young children with autism spectrum disorder. *Journal of Developmental and Physical Disabilities, 30*, 1-16. doi:10.1007/s10882-017-9572-y



## The Effects of Oral Narrative Intervention on the Personal Narratives of Children with ASD and Severe Language Impairment: A Pilot Study

Kate Favot, Mark Carter and Jennifer Stephenson

Macquarie University Special Education Centre, Macquarie University, Sydney, Australia

### ABSTRACT

The purpose of this pilot study was to examine and refine an oral narrative intervention addressing personal narratives of children with autism spectrum disorder (ASD) and severe language impairment. A multiple baseline across participants design investigated the effect of the intervention on the macrostructure of personal narratives. Three five–six year olds participated in a 1:1 intervention that targeted the *where, who with, what* and *feelings* of personal narrative. Intervention included macrostructure icons, pictures, modelling and participants telling the entire narrative. Participants received training with two or three narratives each session. The intervention was effective for all three participants. Two participants showed evidence of maintenance and generalisation across settings. The results show that children with autism and severe language impairment may benefit from oral narrative intervention targeting the macrostructure of personal narrative. These results are consistent with previous findings. Areas for future research include investigation of generalisation across people.

### KEYWORDS

Autism spectrum disorder; children; language intervention; language impairment; narrative; narrative intervention; oral narrative; personal narrative

### Introduction

Narratives are causally related descriptions of events presented in temporal order (Hughes, McGillivray, & Schmidek, 1997). They can be based on real or fictional events and be original or retold. They have a broad importance to social (Boudreau & Chapman, 2000; Crank, Schumaker, & Deahler, 1990; Johnston, 2008; Lever & Sénéchal, 2011), academic (Feagans & Appelbaum, 1986; Hughes et al., 1997; Westby, 1991) and language development (Bishop & Edmundson, 1987).

From childhood, narratives represent a large part of functional discourse and are key to the development of friendship and relationships (Black, Reddington, Reiter, Tintarev, & Waller, 2010; Fivush, 1991; Pennebaker & Seagal, 1999; Preece, 1987). They serve as a bridge between oral language and literacy and subsequently reading (Kaderavek & Sulzby, 2000), writing (Kaderavek, 2015), discussion and comprehension (Nathanson, Crank, Saywitz, & Ruegg, 2007).

**CONTACT** Kate Favot  [kate.favot@mq.edu.au](mailto:kate.favot@mq.edu.au)

© 2018 Informa UK Limited, trading as Taylor & Francis Group

Narratives produced within the mainstream western academic culture are valued according to conventions of macrostructure (overall story structure) (Finestack, 2012; McCabe, 1991) and microstructure (sentence structure) (King, Dockrell, & Stuart, 2014). Narrative macrostructure has been described as the definitional component of narrative (Peterson & McCabe, 1991) as it organises the basic plot (Spencer, Kajian, Petersen, & Bilyk, 2013) or relevant content (Finestack, Palmer, & Abbeduto, 2012) within a cohesive structure (Hedberg & Westby, 1993). Elements of macrostructure for a personal narrative may include where, who, what and an evaluation (Nathanson et al., 2007; Peterson, 1990; Polanyi, 1989).

Most children develop skills in this socially and academically important genre through incidental exposure (Pakulski & Kaderavek, 2012). This is not the case for all children, however, and researchers have documented deficits in the narratives of children with Down syndrome (Boudreau & Chapman, 2000); fragile X syndrome, (Estigarribia et al., 2011); learning disability (Garnett, 1986); specific language impairment (Kaderavek & Sulzby, 2000); Williams syndrome (Marini, Martelli, Gagliardi, Fabbro, & Borgatti, 2010); hearing loss (Pakulski & Kaderavek, 2012); intellectual disability (Boudreau & Chapman, 2000; Finestack & Abbeduto, 2010); and autism (Banney, Harper-Hill, & Arnott, 2015; Goldman, 2008; King, Dockrell, & Stuart, 2013; King et al., 2014; Losh & Gordon, 2014; Loveland, McEvoy, Tunali, & Kelley, 1990).

Autism spectrum disorder (ASD) is a developmental disorder characterised by impairments in the core areas of social communication and social interaction as well as by restrictive or repetitive patterns of behaviour (American Psychiatric Association, 2013). Language and communication difficulties, including problems with narratives, present in essentially all individuals with ASD (Eigsti, de Marchena, Schuh, & Kelley, 2011). Narratives of children with ASD have generally been found to be shorter, less descriptive and less grammatically complex than those produced by typically developing children (King et al., 2013; Tager-Flusberg, 1995). Children with ASD may produce narratives with impaired story structure (Banney et al., 2015), fewer cognitive mental state verbs, fewer causal explanations (Banney et al., 2015; Baron-Cohen, Leslie, & Frith, 1986) and more irrelevant information (Tager-Flusberg).

Investigation into the efficacy of oral narrative intervention with children who are at risk of, or who have, communication impairments is a developing area. There is evidence that explicit narrative intervention may be effective in developing oral narrative skills with children who have communication impairments (Gillam, Hartzheim, Studenka, Simonsmeier, & Gillam, 2015; Petersen, Gillam, Spencer, & Gillam, 2010). Interventions typically share a small range of common features, including the use of macrostructure icon cards to represent the macrostructure of narrative, pictures to support individual stories, clinician modelling of narrative and the participant producing the entire narrative (Brown, Garzarek, & Donegan, 2014; Gillam et al., 2015; Miller, 2014; Petersen et al., 2010, 2014; Spencer & Slocum, 2010; Spencer et al., 2013). However, intervention studies to date have been conducted with children who present with relatively mild disabilities. Two single-case design studies have been carried out with children who had a primary diagnosis of ASD and language impairment (Gillam et al., 2015; Petersen et al., 2014).

When people share personal narratives they are reporting events personally or vicariously experienced (Preece, 1987). The ability to talk about personal events is important in everyday conversation (Preece), and children are much more likely to share a story based in personal experience than relate a fictional story (Johnston, 2008; McCabe, Bliss, Barra, & Bennett, 2008). Up to 70% of children's narratives between the ages of five and seven years have been found to be personal narratives (Preece). Despite the prevalence of personal narrative in



children's talk, the development of an intervention to develop personal narrative has been investigated in only one single-case design study with children who have a diagnosis of ASD (Petersen et al., 2014).

Oral narratives are considered important to social and academic development, and there is evidence that children with both ASD and severe language impairment are at increased risk of having deficits related to the production of oral narratives. Most of the existing research has focused on children with mild disabilities, and currently, there is limited research on teaching narrative skills to children with ASD. Consequently, little guidance is provided on the form and intensity of intervention with children with ASD and severe language impairment. Thus, the present pilot study represents an attempt to address this gap in the research. The specific research questions were:

- (1) Does individualised narrative intervention have an effect on the macrostructure of personal narratives produced by school-aged children with a diagnosis of ASD and severe language impairment?
- (2) Do improvements in the macrostructure of the personal narratives produced by school-aged children with ASD and severe language impairment maintain after intervention has been withdrawn?
- (3) Do improvements in the macrostructure of the personal narratives produced by school-aged children with ASD and severe language impairment generalise to other settings and to other people?

## Method and Materials

### Participants

Three children with ASD and severe language impairment participated in the study. All participants attended the university-based special education demonstration programme where the intervention was to take place. Research conducted in the programme was approved by the university research ethics committee. Participants attended the programme Monday–Friday and were provided with a comprehensive educational programme. Children were eligible for the study if they: (a) had a diagnosis of ASD or pervasive developmental disorder from a paediatrician or psychologist; (b) received a score of 70 or below on the verbal component of a full-scale standardised IQ test or received a Peabody Picture Vocabulary Test, Fourth Edition (Dunn & Dunn, 2007) score at or below the second percentile; (c) had a receptive and expressive language impairment according to results from standardised language assessments; (d) had English as their primary language; (e) had speech intelligible to non-familiar listeners as judged by the first author; (f) were able to sit and participate in instruction at a table for 10–15 min as reported by classroom teachers; (g) spoke using a minimum of two word utterances as reported by classroom teachers; and (h) they did not include all of the following elements in their personal narratives: *where* information, *who with* information, *what* information, and *feelings* about the event.

Diagnoses were made by an independent paediatrician and/or clinical psychologist. The participants' classroom teachers also completed the Childhood Autism Rating Scale, Second Edition (Schopler, Van Bourgondien, & Love, 2010) to evaluate the severity of symptomatology. The first author, the school speech and language pathologist conducted language

assessments for all participants using the Clinical Evaluation of Language Fundamentals Preschool, Second Edition Australian and New Zealand Standardised Edition (Wiig, Secord, & Semel, 2006), the PPVT-4 (Dunn & Dunn, 2007) and mean length of utterance (MLU). Prior to the research, for screening purposes, a personal narrative was collected from each participant by asking each child to 'Tell me about your weekend'. The personal narrative was collected in a quiet room with the participant sitting next to the researcher. The results of these assessments are included in Table 1.

Nine children attending the school met the above criteria for inclusion. Timetabling restraints excluded five of those, and four children, two girls and two boys, were selected to participate in the study. One girl demonstrated mastery of the skills being targeted during early baseline probes, and it was clear that she possessed the skills to be targeted. Three participants continued in the intervention.

Stephano's verbal IQ was rated in the mild range of disability using the Wechsler Preschool and Primary Scale of Intelligence, Fourth Edition (Wechsler, 2012). An overall IQ score was not reported. Classroom teachers reported that at the beginning of the school year Stephano was not able to read any sight words, was able to provide the sound for 2 of the 26 letters, read the numeral 1 and rote count to 13.

Monica's verbal IQ was reported as 70 using the Wechsler Preschool and Primary Scale of Intelligence Australian and New Zealand Standardised Edition, Third Edition (Carstairs, 2004). Teachers reported that at the beginning of the school year Monica was able to read 13 beginning sight words, provide the correct sound for 19 of the 26 letters, write 7 lower case letters, count to 100 and say how many items were in a group.

Results of a standardised IQ test were not available for Franco. Classroom teachers reported that at the beginning of the school year Franco was able to read 32 sight words, provide the correct sound for 8 single letters, count to 55 and orally solve simple addition problems.

### Experimental Design

A multiple baseline with probes design across participants was implemented to investigate the effects of an explicit personal narrative intervention on the macrostructure of school-aged children's narratives. Maintenance and generalisation across settings and people probes were collected for two participants.

### Materials

The researcher used a whiteboard (40 × 30 cm) and icon cards (5 cm × 5 cm) in each session. Participants' families were initially asked to prepare two different personal narratives each week that related to events during the previous weekend and email them to the researcher on Monday of each week. If parents did not provide the materials ready for use each Monday morning, they were contacted and reminded to send their narratives. A template was sent home to the families to assist in the weekly preparation. Families were asked to include in the two prepared narratives information about *where* the event happened (it could be that they stayed at home), *who* was present, *what* they did (this maybe more than one piece of information) and finally, the student's *feelings* about the event(s). The families were also asked to provide a photograph, with the participant in the foreground that clearly

**Table 1.** Participant information.

Name	Age (years; months)	Diagnosis	Adaptive behaviour	CARS-2	CELP-2	PPVT-4	MLU	Screening narrative
Stephano	5;1	ASD (DSM 5)	Mild range of disability (Vineland-II)	Mild to moderate range of ASD	Severe range of disability	12th percentile	5.9	No response
Monica	5;4	Autistic disorder (DSM-IV-TR)	Extremely low range (ABAS-II)	Mild to moderate range of ASD	Severe range of disability	4th percentile	5.7	No response
Franco	6;7	Autism (ADOS-2)	Borderline range (ABAS-II)	Severe range of ASD	Severe range of disability	1st percentile	5.5	No response

Note: DSM 5 = Diagnostic and statistical manual of mental disorders (2013); DSM-IV-TR = Diagnostic and statistical manual of mental disorders (2000); ADOS-2 = Autism Diagnostic Observation Schedule, Second Edition (2012); Vineland-II = Vineland Adaptive Behavior Scales, Second Edition (2005); ABAS-II = Adaptive Behaviour Assessment System, Second Edition (2003).

represented the location, activity and others present. They were asked not to discuss the narratives or materials with the participants. The information about the requirements was provided to parents through a phone call and a letter explaining the required structure and giving supporting examples. On Monday mornings, one of the narratives was randomly selected as the weekly probe stimulus and the other narrative was used for the intervention during that week. Both the probe and the intervention narratives contained information that would inform a response to the cue 'Tell me about your weekend'. When the information was received, the photos were printed in colour. All photos were approximately 15 cms × 10 cms.

Picture Communication Symbols (Boardmaker® (Version 6) [Computer software], 2008) representing *where*, *who with*, *what* and *feelings* were used as macrostructure icons (visual supports) to teach each of the macrostructure components of personal narrative. The symbols were printed in colour onto cards approximately 5 cm × 5 cm, and laminated.

### Dependent Variables

The dependent variable was the macrostructure of personal narrative. Macrostructure comprises the inclusion of content and organisation (Finestack, 2012). Information regarding, where, who with, what happened and a personal response have been identified as four key components of a personal narrative (Nathanson et al., 2007; Rixon & Jaeger, 2011). Definitions of each element of the personal narrative and examples are provided in Table 2. Utterances of any length, including single words were acceptable. The components were not required to be linked grammatically, or to be provided in a specific order.

Each personal narrative was scored out of a possible eight points. Each of the four components was scored according to whether the element was present (one point) and whether it was accurate (one point). Accuracy was determined by whether the narrative accorded with the information provided by parents beforehand or, if the information was not included in that provided by the parents, it could be verified with the parents after the session.

### Procedures

In both the baseline and probe, the participant interacted with the researcher at a table in a small room adjacent to their regular classroom. The researcher sat next to the participant. In both baseline and intervention sessions, participants were praised for quiet sitting or looking at the photo. Reminders to look or attend to the task were used if necessary and praise for being on task was used as needed.

**Table 2.** Definitions for dependent variables.

Element	Criteria for element	Acceptable	Unacceptable
Where the event happened ( <i>where</i> )	Naming a specific place	To the beach Stayed at home	There That place
Who was present ( <i>who with</i> )	Naming people by name or relationship	My mum My sister Graham	Her The people
What the participant did there ( <i>what</i> )	Names an activity	<i>Jumped</i> in the waves <i>Played</i> with my friends	Did that
Feelings or personal reaction ( <i>feelings</i> )	Description of emotion or reaction	It was fun	The end That's it

### Baseline

Baseline sessions comprised two probes (without and then with the macrostructure icons as described below). Daily baseline sessions were commenced with the first participant while weekly baseline probe sessions were conducted with the other two participants. When the first participant displayed a stable baseline across at least five data points in both baseline probe conditions, he entered intervention. Once an intervention effect was demonstrated, daily baseline was to commence with the next participant. Due to a procedural error, five daily baseline data points were not collected for the second participant. As parents sent in two narratives weekly, one of the prepared personal narratives was chosen at random as the stimulus in baseline sessions.

All of the baseline sessions were video recorded on an iPhone 4 placed in a raised position on the desk, to allow for collection of interrater and procedural reliability. All participant responses were transcribed *in situ* if possible or from the video recording.

Two probes were conducted in each session. The first probe condition was conducted using only the stimulus photo. The photo was placed on the inclined whiteboard and secured with a magnet. The researcher obtained the participant's attention by pointing to the photo and asking the participant to look at it. The researcher then said 'Tell me about your weekend'. When the participant stopped talking for three seconds, the session was terminated. The researcher thanked the participant but made no comments on the narrative.

The second probe condition was carried out immediately after the first. The same stimulus photo stayed on the whiteboard. In addition to the photo, the macrostructure icons were placed across the top of the whiteboard above the photo, in the following order, *where, who with, what* and *feelings*. The researcher did not explain the macrostructure icons. The same cues were used as in the first condition.

### Intervention Probes

Two assessment probes were conducted at the beginning of each intervention session (i.e. prior to any intervention) using the same procedures as in the baseline sessions. The first probe used the photo only and the second used both the photo and macrostructure icons. The assessment probe data were collected using stimulus photos that were not used in the intervention.

### Intervention

Intervention occurred immediately after the probes and was implemented by the first author. Participants received four 4–10 min intervention sessions a week. Probe and intervention sessions were conducted individually in a small room next to the participants' classroom.

Wording of the intervention was adapted for each participant's language level. The intervention incorporated features of interventions used with other populations to develop the macrostructure of narrative, the use of macrostructure icons, use of pictures to represent specific narratives, modelling and requiring the participants to produce entire narratives.

The sequence of intervention steps was designed so the participants could produce each component of the personal narrative separately and then have an opportunity to tell the entire personal narrative independently by the end of each session. The initial procedures

for presenting the pictures and icons were the same as for the picture and icon probes. The photo was presented on the board with the four icons placed above. The researcher said 'Tell me about your weekend', and simultaneously pointed to the icon for *where* at the top of the board and asked, 'Where did you go?' If the participant responded correctly the researcher provided confirming feedback ('Yes' and repeated the name of the place) and pointed to the macrostructure icon for *where*, and stated 'You told me where'. The researcher then moved the icon for *where* to the bottom of the board. Moving the icon indicated to the participant that piece of information was included in the narrative and the session was moving on to the next piece of information. If the participant provided incorrect information to the *where* question the researcher stated the name of the place and then asked, 'Where did you go?' and pointed to the macrostructure icon for *where*. If the participant responded correctly after the correction, then it was treated as a correct response. If the participant did not respond within 3 s or made an error, the researcher modelled the correct response and moved the macrostructure icon to the bottom of the board and moved to the next icon.

Similar procedures were used to elicit responses for *who with*, *what* and *feelings*. When each correct response was elicited, or after an error or no response to the corrective feedback, the macrostructure icon for that component was moved to the bottom of the board. At the end of that stage of the intervention, all four macrostructure icons were at the bottom of the board under the photo.

In the next stage of the intervention, the participant was asked to produce the whole narrative and the researcher pointed to the macrostructure icon for *where* as a cue to begin. As the participant provided information for each component, the researcher pointed to the next icon. If the participant provided incorrect information or no information, the researcher immediately provided the correct information component and then pointed to the next icon. The participant was not asked to repeat the information.

When the participant finished their narrative, the researcher immediately provided a model for the whole narrative while pointing to the appropriate icons. If any errors were made when the participant provided the first whole narrative, the researcher provided a second opportunity for the participant to state the whole narrative again. The researcher provided immediate corrective feedback if the participant made an error or missed any information. At the end of the session, the researcher thanked the participant.

After 11 intervention sessions (intervention Phase 1), the first participant, Stephano was making little progress in either probe conditions. The intervention was modified (intervention Phase 2), and the number of training narratives provided by the families was increased to three. The probe narrative was still randomly selected and the other narratives were available for intervention. The researcher made a decision in each session regarding how many narratives to teach based on the participant's attention and behaviour. The remaining two participants received Phase 2 training only with a maximum of three narratives each session. Details of the number of narratives taught per sessions are provided in the results.

After approximately 20 intervention sessions Franco began to persevere on the beginning of his narratives and state 'I stayed at home with *name*', regardless of where he went. At that time, the researcher asked Franco's family to provide narratives with a wider range of settings and people as stimulus materials.

### Maintenance and Generalisation Procedures

Maintenance and generalisation probes were collected for two of the three participants. The same procedure was used as in baseline. Three sets of generalisation data were collected. Two classroom generalisation probes were conducted each week, as part of the regular classroom personal narrative presentation session, with participants presenting to the students and teachers using the same stimulus photo that was used to collect the maintenance data. The first probe was collected, using the stimulus photo and the macrostructure icons. The second probe was collected on a different day in the same week, using the stimulus photo only. The participant sat at the front of the class with the researcher, who was holding a whiteboard with either the photo and icons or the photo only attached. The researcher said 'Tell me about your weekend'. For Stephano, in the photo only condition, the researcher pointed to the space at the bottom of the board where the icons would have been. This was done on the first photo only session only as after that, he produced the entire narrative. When the participant stopped talking the researcher thanked the participant. Only general behavioural feedback was given (e.g. great sitting) and no language feedback was given. The session was recorded by one of the teachers with an iPhone 4 and the narrative was transcribed after the session.

The third set of generalisation data were collected by the school principal, who teaches the participants but was not involved in the intervention, in a 1:1 setting. No photos or icons were provided as support. The session was recorded on an iPhone 4 that was mounted on the desk. The school principal said to the participant 'Tell me about your weekend'. After the participant had stopped talking for 3 s, she thanked the participant and stopped the recording. The recording was passed to the researcher for transcription. The generalisation data were scored according to the criteria set out for baseline and probe data. Maintenance and generalisation data were not collected for Franco. He had begun to perseverate on the *where* component and began every narrative with 'I stayed at home'. A greater range of narratives, with regard to location, was requested from home but this proved difficult for the family to consistently supply. The researchers decided not to enter the maintenance and generalisation phase, as this perseveration error was not able to be resolved before the end of the study.

### Interrater Reliability

A trained second observer independently scored 20% of the two daily probes and intervention sessions from the video recordings for interrater and procedural reliability. Interrater reliability was scored in two stages to achieve an interrater reliability score for the presence of the macrostructure components and for the accuracy of the macrostructure components that were agreed to be present. In the first stage, the probes were scored for agreement as to the presence or absence of each of the elements of *where*, *who with*, *what* and *feelings*. The total number of macrostructure elements agreed on to be present or absent was divided by the total number of macrostructure elements and then multiplied by 100. In the second stage, the elements that were agreed to be present were then scored for agreement on accuracy. Accuracy was determined by comparing the child's narrative with information provided by the family. The total number of agreed accuracy components was divided by the total number of possible accuracy components and multiplied by 100. Mean reliability

across participants and across photo only and photo and icons conditions for presence of macrostructure components was 94%. For Stephano and Franco, mean reliability was 97% (range 75–100%) and mean reliability for Monica was 88% (range 50–100%). Mean reliability across participants and across photo only and icons conditions for accuracy of macrostructure components was 94%. For Stephano and Monica, mean reliability was 93% (range 50–100%) and mean reliability for Franco was 95% (range 50–100%). Low reliability scores occurred in a small number of occasions due to disagreements in the interpretation of what the participant had said.

### **Procedural Reliability**

A research assistant conducted a procedural reliability check on 20% of all intervention sessions using a procedural reliability checklist. Each step was scored as either correctly or incorrectly completed. Omitted steps were scored as errors. Steps that were optional, for example, error correction if no errors were made, were coded as not applicable and not included in calculations. The mean procedural reliability for Stephano was 91% (range 78–93%), for Monica 87.5% (range 81–93%) and for Franco the mean was 90% (range 80–94%). Steps in procedural reliability marked as incorrect were minor variations in wording in the vast majority of instances.

### **Social Validity**

A person with no experience working with children with disability watched four sets of randomly selected narratives, each consisting of one from baseline and one after intervention for each participant. Narratives were presented in random order with regard to whether the baseline or intervention was presented first. The observer was asked to select the better narrative. No explanation of what constituted a better narrative was given.

## **Results**

Figure 1 shows the effects of narrative intervention on the macrostructure of personal narrative for each participant in the photo with macrostructure icons condition. Figure 2 shows the effects of narrative intervention on the macrostructure of personal narrative for each participant in the photo only condition. A clear intervention effect was obtained for all three participants in the photo with icons condition and in the photo condition. Two participants showed maintenance effects and two showed generalisation across settings.

Stephano received 47 intervention sessions and approximately 200 min of intervention. Sessions ranged between 4 and 10 min each. In the photos with icons condition his baseline score ranged between 0 and 6 but stabilised at two. Little progress was made in the first 11 intervention sessions (Phase 1) and the number of training narratives was increased in Phase 2 after 11 intervention sessions. Once the number of training narratives was increased, a mean of 2.25 narratives were trained in each session. Scores varied between 2 and 8 over the next 15 probes before they stabilised at 8. In the photo only condition, Stephano's baseline was stable at two. After 35 intervention sessions, Stephano's probe score increased to eight and became stable.



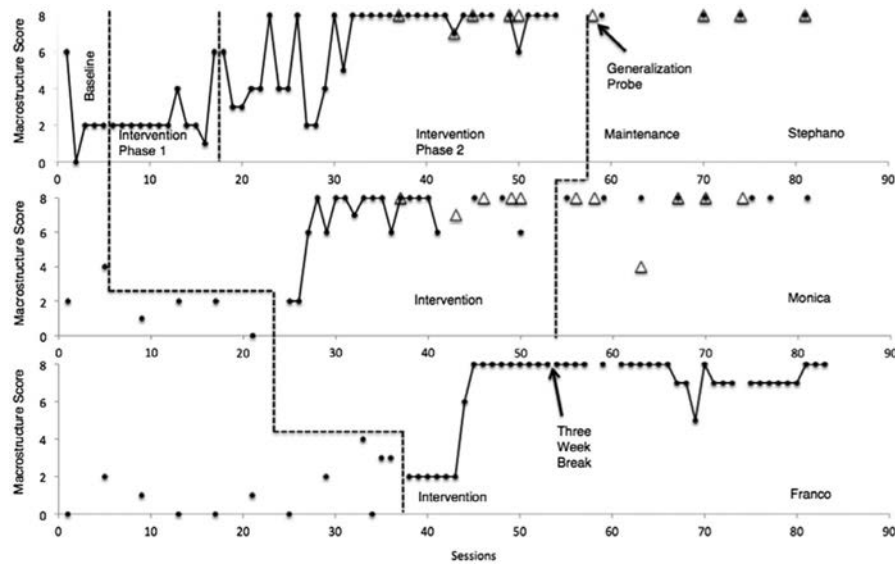


Figure 1. Macrostructure score in photo with icons condition.

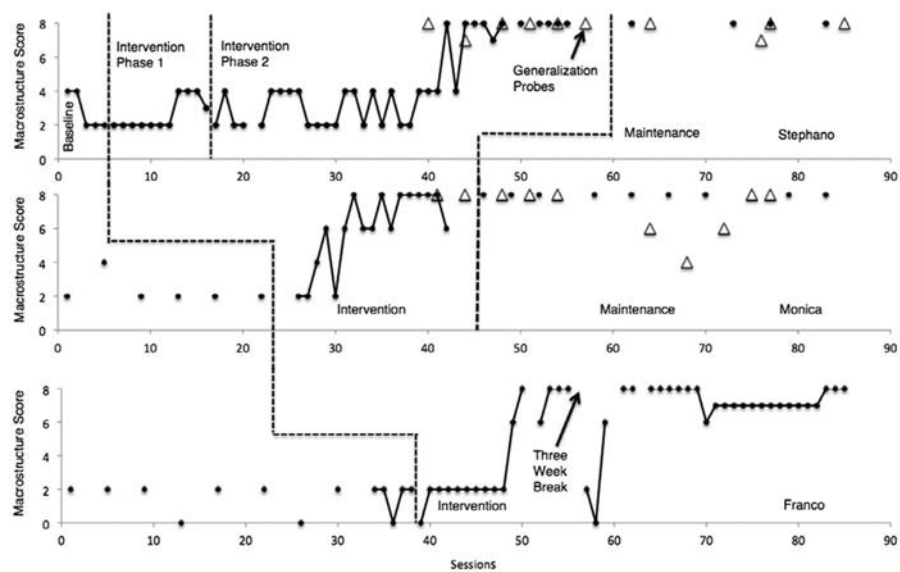


Figure 2. Macrostructure score in photo only condition.

Monica received training with three narratives as per Phase 2 procedures from the beginning of intervention. She received 16 intervention sessions and approximately 85 min of intervention. Sessions ranged between 4 and 8 min. An average of 2.4 narratives were trained in each session. In the photos with icons condition, Monica scored between four and zero

over six weekly probes. Due to an administrative error, a true baseline over five consecutive days was not taken in either condition. After two intervention sessions, Monica's scores were mostly eight with a few variations at seven or six. Monica's baseline in the photo only condition was generally low and stable at two. She received two intervention sessions before her score increased to six or eight.

Franco received training with three narratives from the beginning of intervention. He received 43 sessions and approximately 220 min of intervention. Sessions ranged between 3 and 10 min. An average of 2.4 narratives were trained in each session. In the photos with icons condition, Franco's weekly probe and true baseline scores varied between zero and four. He received six intervention sessions before his score rose to eight where it remained stable. In the photos only condition, Franco's weekly probes and true baseline were either zero or two. Once intervention began, he scored zero or 2 over 10 sessions and then increased to 6 or 8. A three-week break, due to school holidays, occurred after six sessions. When intervention was resumed after the break, he scored two and then zero. His scores then increased to six and then to eight, where it remained stable. Toward the end of intervention, however, Franco's scores dropped to seven. He began all narratives with 'I stayed at home', regardless of the actual location of that week's narrative.

### **Maintenance and Generalisation**

Stephano and Monica entered maintenance after a three-week break due to school holidays. They both scored between six and eight in both conditions. Three sets of generalisation data were taken. The first two sets were taken in the participants' regular classroom as part of the personal narrative presentation session led by the researcher. Stephano scored either seven or eight in both the photos with icons condition and the photo only condition. Monica scored between four and eight in both conditions. Although she did score four on one occasion, Monica scored eight in six of the nine data points in the photo only condition. Data for generalisation across people are included in Table 3. On one occasion Stephano scored eight, but on the following two narratives his score fell to four. On those two occasions each of the macrostructure elements were present but he repeated narratives from previous weeks, so was not able to score for accuracy.

**Table 3.** Generalisation scores across people (maximum eight).

Session number	Stephano	Monica
22		2
23		2
23		1
23		1
24		3
24		0
24		6
24		0
25		0
48	2	
48	8	
50	4	
50	4	

### Social Validity

Social validity was assessed by asking an independent rater to compare pre and post narratives that were presented in random order. The observer selected the post intervention narrative as the better narrative in 11 out of 12 instances.

### Discussion

The purpose of this pilot study was to investigate the effects of oral narrative intervention on the personal narratives of children with a diagnosis of ASD and severe language impairment. This extends the research as participants in this study had greater levels of disability than in most previous studies. Narratives were elicited under probe conditions, with photo and icons and photo only, during baseline and immediately before each intervention session. The oral narrative intervention was effective in teaching all three participants to include elements of macrostructure (*where, who with, what, feelings*) in personal narratives. For two of the participants, the intervention effects were maintained after three weeks and generalised to other settings.

The results of this study are consistent with previously reported interventions that have also included the use of macrostructure icons, pictures to represent specific narratives, modelling, and the participant saying an entire narrative independently (Brown et al., 2014; Miller, 2014; Petersen et al., 2014; Spencer & Slocum, 2010; Spencer et al., 2013). The current study has shown that the basic intervention techniques used can be effective with children with ASD and severe language impairment. These common materials and strategies have been used by previous researchers to teach fictional narrative. This study demonstrates that these materials and strategies can be used to teach a different narrative genre, specifically personal narratives.

Part of the intention of the study was to provide information on the intensity and form and to allow appropriate adjustments to be made. The original intervention was to teach one narrative each session. This was not of sufficient intensity, however, to have an effect with the first participant. Intervention intensity was increased to between two and three narratives per session once it became apparent that the first participant was not making progress. This level of intensity proved adequate for all three participants.

For both Monica and Franco treatment, effects in both the photo plus icon condition and the photo only occurred quickly and simultaneously. For Stephano treatment, effect in the photo plus icon condition was also rapid. It took 34 sessions, however, for him to produce the entire narrative with the photo only. It appeared Stephano was not linking the photo plus icon condition and the photo only condition. The link appeared to be established in the generalisation probe when the teacher pointed to the empty space where the icons would be. This structured fading of procedure could be incorporated into the intervention by adding in a photo only step with the teacher pointing to where the icons would be.

At the end of the intervention period, Franco began introducing all narratives with 'I stayed at home' regardless of where the narrative took place. It seemed that he had rote learned this phrase as a way to introduce all narratives regardless of the setting. Once it became apparent, he was perseverating the researchers requested that the parents provide a greater variation in the settings, but they were only able to provide limited variation. These results highlight the need for sufficient variation in the critical elements of personal narrative

to allow ongoing flexibility. Behavioural inflexibility is a core characteristic associated with ASD and intervention programmes may need to be systematically designed to enhance response flexibility.

Generalisation was assessed across a wider range of conditions than in previous research (Petersen et al., 2010; Spencer et al., 2013). Generalisation of skills learned in the intervention session occurred across settings with Stephano and Monica. Generalisation across people was less successful. Although Stephano scored eight on one occasion when giving a personal narrative to different people, he repeated the same narrative in subsequent weeks, so although he was able to score on presence of elements he was not able to score on accuracy. Monica's performance when giving a narrative to different people was also variable. She included some information some of the time when responding to the prompt to talk about her weekend. On three occasions, like Stephano, she also included information from narratives that didn't relate to the weekend that had just passed. On two occasions, she stated that she wanted to get back to the 'work' of the lesson. Strategies to improve generalisation across people, such as having multiple persons delivering the intervention, could be examined in future research.

It should be noted as a limitation of the study that generalisation across settings and people data should have been collected for Franco as soon as he began to show an intervention effect. Although generalisation data are limited, however, this intervention is the first single-case design intervention to present generalisation data across people and settings.

The authors of one previous study (Petersen et al., 2014) examined the effects of a narrative intervention on individual macrostructure components of personal narrative in children with ASD. The dependent variables in Petersen's study were more sophisticated than those in the present study in that they assessed participant's abilities to generate high-point narratives, including a statement of setting, problem, action, ending and emotions (Hughes et al., 1997). Participants in the current study may have had a greater level of intellectual disability and language impairment and they were not able to display any skills prior to intervention. For this reason, high-point narratives were not appropriate for participants in this study. Learning to state who does what, with whom represents an important first step toward recounting events (Goldman, 2008) or an approximation of storytelling. Future research could incorporate examination of high-point personal narratives with students who have ASD and severe language impairment.

Data on the accuracy of personal narratives were collected. No other studies have been located where accuracy was evaluated, including Petersen et al. (2014). A difficulty with personal narrative is establishing accuracy and this study demonstrates a protocol for both teaching narratives and evaluating their accuracy.

Ease of adaptation to the classroom is important in the research-to-practice framework (Brown et al., 2014). The intervention in this study required one to one intervention and withdrawal from the regular classroom. This may not always be a practical option for teachers and clinicians. Researchers in two previous studies that have been able to show experimental effect have implemented intervention in small groups (Brown et al., 2014; Spencer & Slocum, 2010) and group intervention should therefore be an avenue for future research. The intervention approach used in this study could be adapted and implemented as a group intervention within the context of a typical class setting. The intervention sessions are short and

the innovative semi-scripted intervention style for narrative elicitation provides structure for the teacher or clinician.

This intervention also required a commitment from families to provide weekly narratives. This also may not always be a practical option for clinicians. This limitation could be addressed by sourcing personal narratives from events within the class and school. It is also important to note that a procedural error was made in collecting the baseline with Monica. A true baseline across five consecutive sessions should have been taken to ensure that exposure to the task alone was not responsible for effect. Finally, it should be acknowledged that single-case research has inherently limited external validity given that a small number of participants are included. Thus, replications of this study are needed to evaluate the generalisability of findings.

Apart from replication of the present pilot study, areas for future research include further examination of group delivery of intervention and development of more sophisticated high-point personal narrative. Future research could also include investigation of other narrative forms such as fictional research with children with ASD.

## Conclusion

In this article, the effects of an oral narrative intervention addressing the macrostructure of personal narratives in three participants with ASD and severe language impairment are described. The present pilot study allowed refinement of the intervention in regards to the intensity and intervention. Key features of the intervention included: the use of macrostructure icons to represent the *where*, *who with*, *what* and *feelings* of an early developing personal narrative, pictures to represent each specific narrative, modelling and the participant producing the entire narrative. The skills taught in intervention were maintained after a three-week break and generalised across settings for two of the three participants. Suggestions for future research have been offered.

## Disclosure Statement

No financial interest or benefit has arisen from the direct application of my research.

## References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed, text rev). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Banney, R. M., Harper-Hill, K., & Arnott, W. L. (2015). The Autism Diagnostic Observation Schedule and narrative assessment: Evidence for specific narrative impairments in autism spectrum disorders. *International Journal of Speech - Language Pathology*, 17, 159–171. doi:10.3109/17549507.2014.977348
- Baron-Cohen, S., Leslie, A. M., & Frith, U. (1986). Mechanical, behavioural and intentional understanding of picture stories in autistic children. *British Journal of Developmental Psychology*, 4, 113–125. doi:10.1111/j.2044-835X.1986.tb01003.x
- Bishop, D. V. M., & Edmundson, A. (1987). Language-impaired 4-year-olds distinguishing transient from persistent impairment. *Journal of Speech and Hearing Disorders*, 52, 156–173. doi:10.1044/jshd.5202.156

- Black, R., Reddington, J., Reiter, E., Tintarev, N., & Waller, A. (2010). *Using NLG and sensors to support personal narrative for children with complex communication needs*. Proceedings from Proceedings of the NAACL HLT June 2010 Workshop on Speech and Language Processing for Assistive Technologies, Los Angeles CA.
- Boardmaker® (Version 6) [Computer software]. (2008). *Solana Beach*. Solana Beach, CA: Mayer-Johnson.
- Boudreau, D. M., & Chapman, R. S. (2000). The relationship between event representation and linguistic skill in narratives of children and adolescents with down syndrome. *Journal of Speech, Language, and Hearing Research*, 43, 1146–1159. doi:10.1044/jslhr.4305.1146
- Brown, J. A., Garzarek, J. E., & Donegan, K. L. (2014). Effects of a narrative intervention on story retelling in at-risk young children. *Topics in Early Childhood Special Education*, 34, 154–164. doi:10.1177/0271121414536447
- Carstairs, J. (2004). *Wechsler preschool and primary scale of intelligence, Australian: Administration and scoring manual* (3rd ed.). Sydney: The Psychological Corporation.
- Crank, J. N., Schumaker, J. B., & Deahler, D. D. (1990). A self-instructional surface counselling program. *Learning Disabilities*, 1, 102–112.
- Dunn, L. M., & Dunn, D. M. (2007). *Peabody picture vocabulary test: Fourth Edition (PPVT-4) [Assessment instrument]*. Minneapolis, MN: Pearson Assessments.
- Eigsti, I., de Marchena, A. B., Schuh, J. M., & Kelley, E. (2011). Language acquisition in autism spectrum disorders: A developmental review. *Research in Autism Spectrum Disorders*, 5, 681–691. doi:10.1016/j.rasd.2010.09.001
- Estigarribia, B., Martin, G. E., Roberts, J. E., Spencer, A., Gucwa, A., & Sideris, J. (2011). Narrative skill in boys with fragile X syndrome with and without autism spectrum disorder. *Applied Psycholinguistics*, 32, 359–388. doi:10.1017/S0142716410000445
- Feagans, L., & Appelbaum, M. I. (1986). Validation of language subtypes in learning disabled children. *Journal of Educational Psychology*, 78, 358–364. doi:10.1037/0022-0663.78.5.358
- Finestack, L. H. (2012). Five principles to consider when providing narrative language intervention to children and adolescents with developmental disabilities. *Perspectives on Language Learning and Education*, 19, 147–154. doi:10.1044/lle19.4.147
- Finestack, L. H., & Abbeduto, L. (2010). Expressive language profiles of verbally expressive adolescents and young adults with down syndrome or fragile X syndrome. *Journal of Speech, Language, and Hearing Research*, 53, 1334–1348. doi:10.1044/1092-4388(2010/09-0125)
- Finestack, L. H., Palmer, M., & Abbeduto, L. (2012). Macrostructural narrative language of adolescents and young adults with down syndrome or fragile X syndrome. *American Journal of Speech Language Pathology*, 21, 29–46. doi:10.1044/1058-0360(2011/10-0095)
- Fivush, R. (1991). The social construction of personal narratives. *Merrill-Palmer Quarterly*, 37, 59–81.
- Garnett, K. (1986). Telling tales: Narratives and learning-disabled children. *Topics in Language Disorders*, 6, 44–56. doi:10.1097/00011363-198603000-00006
- Gillam, S. L., Hartzheim, D., Studenka, B., Simonsmeier, V., & Gillam, R. (2015). Narrative intervention for children with autism spectrum disorder (ASD). *Journal of Speech Language and Hearing Research*, 58, 920–933. doi:10.1044/2015\_JSLHR-L-14-0295
- Goldman, S. (2008). Brief report: Narratives of personal events in children with autism and developmental language disorders: Unshared memories. *Journal of Autism and Developmental Disorders*, 38, 1982–1988. doi:10.1007/s10803-008-0588-0
- Harrison, P., & Oakland, T. (2003). *Adaptive behavior assessment system: Second edition (ABAS-II) [Assessment instrument]* (2nd ed.). San Antonio, TX: The Psychological Corporation.
- Hedberg, N. L., & Westby, C. E. (1993). *Analysing storytelling skills: Theory to practice*. Tuscon, AZ: The Psychological Corporation.
- Hughes, D. L., McGillivray, L., & Schmidek, M. (1997). *Guide to narrative language: Procedures for assessment*. Eau Claire, WI: Thinking Publications.
- Johnston, J. R. (2008). Narratives: Twenty-five years later. *Topics in Language Disorders*, 28, 93–98. doi:10.1097/01.TLD.0000318931.08807.01
- Kaderavek, J. (2015). *Language disorders in children: Fundamental concepts of assessment and intervention* (2nd ed.). Boston, MA: Pearson.

- Kaderavek, J. N., & Sulzby, E. (2000). Narrative production by children with and without specific language impairment oral narratives and emergent readings. *Journal of Speech, Language, and Hearing Research, 43*, 34–49. doi:10.1044/jslhr.4301.34
- King, D., Dockrell, J. E., & Stuart, M. (2013). Event narratives in 11-14 year olds with autistic spectrum disorder. *International Journal of Language and Communication Disorders, 48*, 522–533. doi:10.1111/1460-6984.12025
- King, D., Dockrell, J., & Stuart, M. (2014). Constructing fictional stories: A study of story narratives by children with autistic spectrum disorder. *Research in Developmental Disabilities, 35*, 2438–2449. doi:10.1016/j.ridd.2014.06.015
- Lever, R., & Sénéchal, M. (2011). Discussing stories: On how a dialogic reading intervention improves kindergartners' oral narrative construction. *Journal of Experimental Child Psychology, 108*, 1–24. doi:10.1016/j.jecp.2010.07.002
- Losh, M., & Gordon, P. C. (2014). Quantifying narrative ability in autism spectrum disorder: A computational linguistic analysis of narrative coherence. *Journal of Autism and Developmental Disorders, 44*, 3016–3025. doi:10.1007/s10803-014-2158-y
- Loveland, K. A., McEvoy, R. E., Tunali, B., & Kelley, M. L. (1990). Narrative story telling in autism and Down's syndrome. *British Journal of Developmental Psychology, 8*, 9–23. doi:10.1111/j.2044-835X.1990.tb00818.x
- Marini, A., Martelli, S., Gagliardi, C., Fabbro, F., & Borgatti, R. (2010). Narrative language in Williams syndrome and its neuropsychological correlates. *Journal of Neurolinguistics, 23*, 97–111. doi:10.1016/j.jneuroling.2009.10.002
- McCabe, A. (1991). Preface: Structure as a way of understanding. *Developing narrative structure*, 9–17. Retrieved from [https://books.google.com/books?hl=en&lr=&id=eWNPIFU6iAEC&oi=fnd&pg=PR9&dq=Preface:+Structure+as+a+way+of+understanding+McCabe,+A&ots=y2JnkRJoIT&sig=AkFUFO3I39uhBFhJLf\\_rrwjI8Ug](https://books.google.com/books?hl=en&lr=&id=eWNPIFU6iAEC&oi=fnd&pg=PR9&dq=Preface:+Structure+as+a+way+of+understanding+McCabe,+A&ots=y2JnkRJoIT&sig=AkFUFO3I39uhBFhJLf_rrwjI8Ug)
- McCabe, A., Bliss, L., Barra, G., & Bennett, M. (2008). Comparison of personal versus fictional narratives of children with language impairment. *American Journal of Speech-Language Pathology, 17*, 194–206. doi:10.1044/1058-0360(2008/019)
- Miller, R. D. (2014). *The effects of story grammar on the oral narrative skills of English language learners with language impairment* (Unpublished doctoral dissertation). Retrieved from Proquest Dissertations and Theses, Clemson University, SC. (3623890).
- Nathanson, R., Crank, J. N., Saywitz, K. J., & Ruegg, E. (2007). Enhancing the oral narratives of children with learning disabilities. *Reading & Writing Quarterly, 23*, 315–331. doi:10.1080/10573560701501610
- Pakulski, L. A., & Kaderavek, J. N. (2012). Reading intervention to improve narrative production, narrative comprehension, and motivation and interest of children with hearing loss. *Volta Review, 112*, 87–112.
- Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology, 55*, 1243–1254. doi:10.1002/(SICI)1097-4679(199910)55:10<1243::AID-JCLP6>3.0.CO;2-N
- Petersen, D. B., Gillam, S. L., Spencer, T., & Gillam, R. B. (2010). The effects of literate narrative intervention on children with neurologically based language impairments: An early stage study. *Journal of Speech, Language, and Hearing Research, 53*, 961–981. Retrieved from <http://jslhr.pubs.asha.org/article.aspx?articleid=1781593>
- Petersen, D. B., Brown, C. L., Ukrainetz, T. A., Wise, C., Spencer, T. D., & Zebre, J. (2014). Systematic individualized narrative language intervention on the personal narratives of children with autism. *Language, Speech, and Hearing Services in Schools, 45*, 67–86. doi:10.1044/2013\_LSHSS-12-0099
- Peterson, C. (1990). The who, when and where of early narratives. *Journal of Child Language, 17*, 433–455. doi:10.1017/S0305000900013854
- Peterson, C., & McCabe, A. (1991). Linking children's connective use and narrative macrostructure. In C. Peterson & A. McCabe (Eds.), *Developing narrative structure* (pp. 29–54). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.. Retrieved from <http://psycnet.apa.org/psycinfo/1991-97747-001>.
- Polanyi, L. (1989). *Telling the American story: A structural and cultural analysis of conversational storytelling*. Cambridge, MA: MIT Press.
- Preece, A. (1987). The range of narrative forms conversationally produced by young children. *Journal of Child Language, 14*, 353–373. doi:10.1017/S0305000900012976



- Rixon, E., & Jaeger, S. (2011). Narrative therapy: A whole-school approach within a specialist residential school for young people on the autism spectrum. *Good Autism Practice, 12*, 64–74.
- Rutter, M., DiLavore, P. C., Risi, S., Gotham, K., & Bishop, S. L. (2012). *Autism diagnostic observation schedule: Second edition (ADOS-II) [Assessment instrument]*. Los Angeles, CA: Western Psychological Services.
- Schopler, E., Van Bourgondien, M. E., & Love, S. R. (2010). *Childhood autism rating scale: Second edition (CARS-2) [Assessment instrument]*. Los Angeles, CA: Western Psychological Services.
- Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (2005). *Vineland adaptive behavior scales: Second edition (Vineland-II) [Assessment instrument]*. Circle Pines, MN: AGS Publishing.
- Spencer, T. D., & Slocum, T. A. (2010). The effect of a narrative intervention on story retelling and personal story generation skills of preschoolers with risk factors and narrative language delays. *Journal of Early Intervention, 32*, 178–199. doi:[10.1177/1053815110379124](https://doi.org/10.1177/1053815110379124)
- Spencer, T. D., Kajian, M., Petersen, D. B., & Bilyk, N. (2013). Effects of an individualized narrative intervention on children's storytelling and comprehension skills. *Journal of Early Intervention, 35*, 243–269. doi:[10.1177/1053815114540002](https://doi.org/10.1177/1053815114540002)
- Tager-Flusberg, H. (1995). 'Once upon a rabbit': Stories narrated by autistic children. *British Journal of Developmental Psychology, 13*, 45–59. doi:[10.1111/j.2044-835X.1995.tb00663.x](https://doi.org/10.1111/j.2044-835X.1995.tb00663.x)
- Wechsler, D. (2012). *Wechsler preschool and primary scale of intelligence: Fourth edition (WPPSI-IV) [Assessment instrument]*. San Antonio, TX: Psychological Corporation.
- Westby, C. (1991). Learning to talk, talking to learn: Oral literate language differences. In C. S. Simon (Ed.), *Communication skills and classroom success* (pp. 334–357). Eau Claire, WI: Thinking Publications.
- Wiig, E. H., Secord, W. A., & Semel, E. (2006). *Clinical evaluation of language fundamentals preschool: Second edition, Australian and New Zealand standardised edition (CELF-P-2 A&NZ) [Assessment instrument]*. Sydney: Harcourt Assessment.



## Appendix 2

Ethics approval for students under the supervision of Dr Jennifer Stephenson and Dr Mark Carter of Macquarie University Special Education Centre (MUSEC) who conduct research on-site at MUSEC School.

From: "Ethics Secretariat" <ethics.secretariat@mq.edu.au> Subject: Approved- Ethics application- Carter (Ref No: 5201300450) Date: 1 July 2013 3:24:32 PM AEST To: "Associate Professor Mark Carter" <mark.carter@mq.edu.au>

Dear Associate Professor Carter

Re: "Macquarie University Special Education Centre School" (Ethics Ref: 5201300450)

The above application was reviewed by the Human Research Ethics Committee (Human Sciences and Humanities) at its meeting on 28/06/2013. Approval of the above application is granted, effective 01/07/2013. This email constitutes ethical approval only.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

[http://www.nhmrc.gov.au/\\_files\\_nhmrc/publications/attachments/e72.pdf](http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf). The following personnel are authorised to conduct this research:

A/Prof Jennifer Stephenson Associate Professor Mark Carter Dr Alison Madelaine

3 July 2018

Dear Dr Howell,

**Reference No:** 5201800446

**Title:** *Macquarie University Special Education Centre School*

Thank you for submitting the above application for ethical and scientific review. Macquarie University Human Research Ethics Committee (HREC) (Human Sciences & Humanities) considered your application.

I am pleased to advise that ethical and scientific approval has been granted for this project. **Approval Date:** 29 June 2018

This research meets the requirements set out in the *National Statement on Ethical Conduct in Human Research* (2007 – Updated May 2015) (the *National Statement*).

**Standard Conditions of Approval:**

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. This approval is valid for five (5) years, subject to the submission of annual reports. Please submit your reports on the anniversary of the approval for this protocol.

3. All adverse events, including events which might affect the continued ethical and scientific acceptability of the project, must be reported to the HREC within 72 hours.

4. Proposed changes to the protocol and associated documents must be submitted to the Committee for approval before implementation.

It is the responsibility of the Chief investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Should you have any queries regarding your project, please contact the Ethics Secretariat on 9850 4194 or by email [ethics.secretariat@mq.edu.au](mailto:ethics.secretariat@mq.edu.au)

The HREC (Human Sciences and Humanities) Terms of Reference and Standard Operating Procedures are available from the Research Office website at:

<https://www.mq.edu.au/research/ethics-integrity-and-policies/ethics/human-ethics>

The HREC (Human Sciences and Humanities) wishes you every success in your research. Yours sincerely

**Dr Karolyn White**

Director, Research Ethics & Integrity Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research* (2007) and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.