

Research article

Evaluating the efficacy of a small-group oral narrative intervention programme for pre-primary children with narrative difficulties in a mainstream school setting.

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I Abstract

Oral narrative difficulties are well-documented in school-aged children with Developmental Language Disorder, from low socio-economic backgrounds, and from linguistically diverse backgrounds. This study designed and evaluated the efficacy of a manualised (replicable) programme for children in mainstream school with delays in narrative discourse. Efficacy was evaluated using a Phase 1 non-randomised single-subject across multiple-baselines design. The programme was delivered by a speech pathologist to 11 mainstream children aged 5;0-5;11 years, in small groups, three times a week for six weeks. Intervention focused on explicit teaching of narrative macrostructure using icons, graphic organisers, and repeated story retellings. Microstructure (morphosyntax and vocabulary) was targeted using implicit language facilitation procedures including modelling, recasting, expansion and vertical structuring. Participation in the programme resulted in significant changes with moderate to large effect sizes for most participants, in the number of macrostructure elements, and conjunctions and adverbs. Analysis of pre-post standardised narrative data revealed clinically significant improvements for 9 of the 11 participants. The findings add to the research supporting the effectiveness of small group oral narrative intervention.

II Introduction

The development of oral narrative discourse, both comprehension and expression, is considered essential in the development of language and literacy skills in young children (Westby, 1985). Oral narratives draw on the ability to tell a series of causally related events in sequence, and include information about setting, character, the central plot or theme of a story, and enough detail about characters' actions, emotions and motivations throughout, to entertain a listener (Westby, 1985). Oral narratives tend to have a consistent internal structure, referred to as a macrostructure, which in Western cultures includes a setting (character, time, and place), an initiating event (often a causal event or problem), a character response (emotions and plan), a series of attempts, actions and/or events, and an ending (resolution and consequence; Cortazzi & Jin, 2007; Hayward & Schneider, 2000; Petersen, 2010; Westby, 1985). The development of a mature narrative macrostructure occurs by five years of age in typically developing children (Applebee, 1978; Westby, 1985; Stein & Glenn, 1979). During this stage of development, children also begin to use more complex morpho-syntax, including compound and complex sentences, temporal and subordinating conjunctions, adverbial phrases, and adjectives, to add more detail to their stories (Hayward & Schneider, 2000). In narratives literature, these morpho-syntax features are often referred to as microstructure (Petersen, 2010).

Competency with oral narrative is integral to communicative success in both everyday social interactions and the school context (Paul, 1995). Oral narrative performance has been shown to predict children's later academic and linguistic success and is often referred to as the "bridge to literacy" (Fey, Catts, Proctor-Williams et al., 2004; Westby, 1985). Research shows that children rely on the understanding of narrative macrostructure to organise information, and to make sense of what they are reading (Lynch, van den Broek, Kremer et al., 2008). The development of vocabulary and complex syntax also supports the transition from oral to literate language, and comprehension of narrative level discourse (Gillam & Gillam, 2016).

Oral narrative difficulties have been well-documented in school-aged children with Developmental Language Disorder (DLD), children from low socio-economic backgrounds, and children from linguistically diverse backgrounds, including English as an Additional Language/Dialect (EAL/D; Colozzo, Gillam, Wood et al., 2011; Pearce, Williams & Steed, 2015; Petersen & Spencer, 2016). Children who experience difficulties may produce stories that are less developed in macrostructure (including illogical sequencing of events, leaving out elements of a story, and reduced length of narratives), and/or less developed in microstructure (including reduced sentence length and complexity, and reduced lexical diversity (Colozzo et al., 2011; Fey et al., 2004). Oral narrative is therefore often a focus of speech pathology and educator programmes (Cirrin & Gillam, 2008; Ebbels, McCartney, Slonims, Dockrell, & Norbury, 2017; Petersen, 2010).

The most recent systematic review of narrative-based language intervention for preschool and school-age children with language disorder, included nine research articles published between 1980-2010 that evaluated narrative-based language intervention programmes, and interventions that used oral narratives as a context to target language-related (including syntax and vocabulary) skills (Petersen, 2010). For improvements in narrative *macrostructure*, Petersen reported moderate to large effects ($d = .73 - 1.57$) for oral narrative interventions that explicitly taught macrostructure, and included repeated telling, retelling and generating of stories using visual scaffolds, such as icons, and graphic organisers including story boards and planners (Petersen, 2010). In contrast, the effect of narrative intervention on *microstructure* yielded mixed results. Eight of the nine studies in the review reported a focus on microstructure, although there was a lack of detail in the descriptions of therapeutic procedures, and effect sizes varied from negative to positive (Petersen, 2010). Key procedures for microstructure that were identified included strategically modelling and eliciting correct language forms using vertical structuring and focused stimulation (Petersen, 2010). Recommendations of the review included that “repeated story retelling and a focus on narrative macrostructure may be sufficient to facilitate significant improvements in both narrative macrostructure and some elements of microstructure” (Petersen, 2010, p 13), and that clinicians could “continue to treat narratives as a functional language target and as a medium whereby language features are modelled and practiced” (Petersen, 2010, p.13).

Research published since 2010 has provided further evidence for oral narrative intervention, in particular, two research groups have investigated the effects of narrative-based language intervention for pre-school (Petersen & Spencer, 2016) and school-age children (Gillam & Gillam, 2016) with language difficulties. The programmes evaluated in these studies - Story Champs (Spencer & Petersen, 2012), and Supporting Knowledge in Language and Literacy (SKILL; Gillam, Gillam & Laing, 2012) - both include the use of icons, teaching scripts, and story boards, to teach narrative macrostructure explicitly, repeated opportunities for storytelling and retelling using picture prompts, and the creation of parallel stories.

Story Champs has been evaluated in a range of studies, including a single-subject multiple baseline research design (Spencer et al., 2014), a small group quasi-experimental control group design (Petersen et al., 2014) and a large group pre-test/post-test randomised control trial (Spencer et al., 2015), with four-year-old children attending a Head Start intervention centre in America which reported that participants made statistically significant gains in narrative generation, with a large effect size ($d = 1.04$). While these studies provided detail on the therapeutic procedures related to macrostructure, little detail was provided regarding intervention for microstructure, other than modelling in the context of the retell scripts. Additionally, the outcome measure used (Narrative Language Measures Primary;

Petersen & Spencer, 2012) did not provide detail of outcomes on microstructure beyond the inclusion of temporal and causal conjunctions (Spencer et al., 2015).

SKILL (Gillam et al., 2012) focuses on explicit teaching of macrostructure elements, narrative comprehension, and microstructure including vocabulary, causal and temporal connectors and complex sentences. SKILL has been shown to be effective for improving narrative proficiency for school-aged children with language disorder – reporting consistently moderate to large effects ($d = .66 - 2.54$) (Gillam & Gillam, 2016). SKILL has also been associated with some improvements in the syntactic complexity of narrative discourse (Gillam & Gillam, 2016).

Given that narrative difficulties are present in many at-risk school-aged populations (Colozzo, et al., 2011; Pearce, et al., 2015; Petersen & Spencer, 2016), and that narrative is a core focus of the Australian curriculum (Australian Curriculum, Assessment and Reporting Authority, 2015), speech pathologists and teachers are increasingly implementing oral narrative intervention programmes in mainstream school classrooms and contexts. With an ever-increasingly ‘crowded’ curriculum, many teachers do not have the time to plan for explicit teaching (and intervention) for all areas of oral language (i.e. receptive and expressive semantics, syntax, morphology and discourse level skills). With the research suggesting that intervention focusing on explicit teaching of narrative macrostructure incorporating graphic organisers and repeated modelling and retelling of stories, could be hypothesised to have a significant impact on the development of complex linguistic features (microstructure), in addition to macrostructure, further investigation is needed.

The present study thus aimed to develop and evaluate a manualised (replicable), small group oral narrative intervention approach, with an explicit focus on macrostructure, and carefully scripted implicit language facilitation procedures targeting microstructure. It was hypothesised that this intervention, delivered in small groups to young children with delayed oral narrative abilities in a mainstream context, would lead to:

1. Statistically significant improvement in the inclusion of macrostructure elements in single-picture narrative generations;
2. Statistically significant improvement in the inclusion of narrative microstructure features (conjunctions, adverbials, adjectives and complex sentences) in single-picture narrative generations; and
3. Clinically significant improvement in overall oral narrative ability as measured by pre- and post-intervention scores on the Test of Narrative Language (TNL, Gillam & Pearson, 2004).

III Method

Ethical approval was obtained from Curtin University’s Human Research Ethics Committee and the Western Australian Department of Education.

1 Experimental design

For this Phase 1 efficacy study of Robey’s five-phase model, a multiple baseline single-subject research design (SSRD) was used (Beeson & Robey, 2006). Each participant completed three phases - pre-intervention baseline (A), intervention (B) and post-intervention baseline (AB). To demonstrate external validity, the SSRD was replicated across 11 participants and a staggered baseline was used. Staggered baselines help provide additional evidence for the

effect of intervention on the dependent variables (Portney & Watkins, 2009). Measures of statistical *and* clinical significance were used in this study, to determine if the effect of treatment was generalisable to other subjects and if it was clinically important, as clinical significance implies that the difference between conditions is clinically relevant, and statistical significance does not always imply clinical significance (Sedgwick, 2014). See Figure 1 for an overview of the experimental design.

[INSERT FIGURE 1]

2 *Recruitment and participant selection*

A pilot of the researcher-developed Oral Narrative Intervention Programme (ONIP) was conducted with eight participants, in which six made clinically significant improvement as measured by the Test of Narrative Language (TNL: Gillam & Pearson, 2004), demonstrating feasibility of a Phase 1 efficacy trial (Glisson, 2017). Following minor adjustments to the approach, the ONIP was evaluated with 11 pre-primary participants (four girls and seven boys) aged 5;0 to 5;11 (mean age of 5;7) recruited from a West Australian school. In Western Australia, pre-primary is the first compulsory year of schooling, with students between 4-5 years of age commencing at the beginning of the calendar year. Participants were drawn from a mainstream, middle-range socio-economic school, selected by the researcher. The school was currently engaged with the primary researcher in a capacity building service focusing on speech, language and communication, through her role within the Department of Education. No additional speech pathology services were presently being provided at the school and typical classroom practice did not include the explicit teaching of narrative beyond the basic ‘beginning’, ‘middle’ and ‘end’ and weekly story-book reading.

All pre-primary students attending the school were provided with a consent form and letter explaining the programme. Consent and case history forms were received for 21 children between the ages of 5;0 and 6;0, and all children not currently receiving additional speech pathology services were assessed by the primary researcher. The TNL was used to identify children with narrative level difficulties. The final selection of participants included 11 with TNL-Narrative Language Ability Index (NLAI) scores of less than 90 (classified as below the average range), and one whose score was 91 (see table 1). Due to the high levels of students who were multilingual and/or had EAL/D at the school, it was not possible to select only monolingual English-speaking children for inclusion in study, however all participants had been exposed to English for a minimum of three months. No significant history of language, behaviour, hearing or speech difficulties were reported on the parent questionnaire. No additional difficulties were reported on the parent questionnaire. Participant 12 left the school after completion of Phase A and was therefore not included in the intervention. The remaining 11 participants were then randomly allocated into three groups of four, four and three participants, by the primary researcher. (It should be noted that randomisation and blinding is not a requirement of a Phase 1 study (Beeson & Robey, 2006)).

3 *Assessments*

a Test of Narrative Language (Gillam & Pearson, 2004). Pre- and post-treatment data were collected by the primary researcher using the TNL (Gillam & Pearson, 2004). The narrative

samples were scored as per test guidelines to provide the NLAI composite score of overall narrative ability (Gillam & Pearson, 2004). The TNL is an age-standardised test, widely used in clinical practice and research studies investigating the effect of narrative-based intervention and is considered to be a reliable and valid measure of narrative abilities (alpha reliabilities were .76, .87 and .88 for the three subtests) (Gillam & Pearson, 2004). A standard score under 90 is considered below average (Gillam & Pearson, 2004). These data were used for participant selection (see Table 1), and to evaluate the clinical significance of the intervention.

b Additional standardised pre-intervention measures. The following tests were administered by the primary researcher prior to the intervention phase: a) the core subtests from the Wechsler Preschool and Primary Scale of Intelligence (WPPSI; Wechsler, 1989) to assess non-verbal IQ; b) the Peabody Picture Vocabulary Test 4th Edition (PPVT-IV; Dunn & Dunn, 2007) to assess receptive vocabulary, and c) the Expressive Vocabulary Test, 2nd Edition (EVT-2; Williams, 2007) to assess expressive vocabulary. These data were used to provide more information on participant language profiles, and not as part of any inclusion/exclusion criteria (see Table 1).

c Non-standardised experimental repeated measures. A single picture narrative generation task was used by the primary researcher, to elicit oral narrative samples during pre-intervention, post-intervention and intervention phases. The stimulus items were designed in collaboration with Black Sheep Press (www.blacksheeppress.co.uk) and depict a causal event (e.g., a jug of milk being knocked off a table). During the intervention phase, each participant was individually asked to generate a story from a picture, prior to each intervention session. All participants used the same stimulus pictures, with a different picture used at each data collection point. Instructions were “Look at the picture and think of a story to tell me. Oh, something’s happening. Can you tell me a story about what’s happening in the picture?” A total of 30 different pictures were used across the pre-intervention baseline (3-9 samples), intervention (18 samples) and post-intervention baseline phases (3 samples). (For details on the instructions and prompting for this task, see <https://espace.curtin.edu.au/handle/20.500.11937/59145>). Each sample was audio-recorded, transcribed and segmented into communication units (C-units; an independent clause with its modifiers) then coded using the Systematic Analysis of Language Transcripts - Research Version (SALT) (Miller & Iglesias, 2008; Glisson, 2017). Samples were coded for the presence of individual macrostructure features: character, setting [time and place], initiating event, internal response, plan, attempts, complications, solution, conclusion, formulaic markers and character dialogue. The total number of macrostructure elements coded in each sample was then combined into a Total Macrostructure Score (TMSS). This measure was created as an indication of competence with narrative organisation and structure (Stein & Glenn, 1979). Samples were also coded for the presence of four microstructure elements (number of conjunctions, adjectives, adverbials, and complex C-units), as an indication of sentence length and complexity, cohesion, and the development of more complex literate language features within narratives (Ukrainetz, Justice, Kaderavek et al., 2005). For further information on these researcher-designed coding procedures, see Table 2.

4 Participants

[INSERT TABLE 1]

Case history information revealed seven monolingual, and two multilingual (P9 & P10) participants. Participant 8 was an EAL/D learner with more than 3 months exposure to English and had expressive vocabulary more than one standard deviation below the mean, but receptive vocabulary within the normal range. Participant 2 had a significant history of language difficulties and scored in the severe range for expressive and receptive vocabulary difficulties, had an NLAI score in the ‘very poor’ range and non-verbal IQ in the normal range. Five participants had nonverbal IQ scores between one and two standard deviations below the mean. These scores demonstrate a wide range of abilities within the intervention group, felt to be representative of the range of children in a mainstream classroom, with difficulties in narrative discourse.

[INSERT TABLE 2]

5 Procedures

a Pre-intervention baseline phase. The first baseline phase (A1) was administered prior to the commencement of intervention, by the primary researcher. All participants commenced baseline at the same time. Group 1 had a one-week baseline, with data collected three times a week (3 sessions), Group 2 had a two-week baseline, with data collected three times a week (6 sessions), and Group 3 had a three-week baseline, with data collected three times a week (9 sessions).

b Intervention phase. The ONIP was delivered by the primary researcher to small groups for 30-45-minute sessions, three times a week for a period of six weeks (total of 18 sessions, phase B). The ONIP was designed to include two phases of intervention – Phase One focused on the explicit teaching of narrative macrostructure and introduction to the therapy procedures and contexts - including repeated book shares, graphic organisers, narrative icons and “stepping out” stories - while Phase Two focused on applying knowledge of narrative macrostructure, to support the retelling of children’s books, with modelling of microstructure. Tables 3 and 4 summarise the intervention structure of the ONIP. Each session used an established format of a book share, an explicit narrative teaching focus using visual supports and gestures, application of the explicit focus into a picture book, and oral language games to further consolidate the concept. Each session was scripted to include a task instruction, a model, and carefully planned contingent responses and cueing hierarchies for each activity.

[INSERT TABLE 3]

[INSERT TABLE 4]

The key narrative intervention procedures and strategies in the ONIP included the following:

- Explicit teaching to increase children’s awareness of narrative macrostructure using teaching scripts, icons and gestures, and storyboards.
- A book share protocol to support text comprehension.
- Multiple opportunities to listen to and engage in storytelling.
- The use of familiar children’s storybooks as a context through which to teach macrostructure elements and for retelling stories.
- Modified scripts of the storybooks during modelled and elicited retells.
- Scripted contingent responses and cueing hierarchies for macrostructure targets.
- Scripted implicit grammar facilitation techniques, which respond to a child’s errors in a naturalistic way, and include recasting, expansion and vertical structuring for microstructure targets.
- Active listening strategies, including routines for “whole body listening” and the use of narrative icon checklists/charts when listening to peers.
- A gradual release of responsibility (Fisher & Fey, 2008).

(for details of scripted lesson plans, contingent responses, cueing hierarchies and examples - <https://espace.curtin.edu.au/handle/20.500.11937/59145>).

c Post-intervention baseline phase. The week immediately following the completion of the intervention phase, the TNL was re-administered, and three baselines were collected (AB1, AB2, AB3) at three different time points over the week, using the same elicitation procedures as in the pre-intervention and intervention phases. All post- intervention measures were collected by the primary researcher.

6 Statistical analysis.

The efficacy of the intervention was evaluated considering the pre- and post-intervention scores on the TNL (Gillam & Pearson, 2004), as well as analysis of the repeated measures (i.e., the dependent variables) for macrostructure and microstructure scores - TMSS, Total Number of Conjunctions, Adjectives, Adverbs, and Complex C-units.

The standard scores and clinical category (as defined in the TNL manual) were examined to determine *clinically significant* change in the TNL scores (Gillam & Pearson, 2004).

The repeated measures were analysed to determine statistically significant change, and if the observed changes were related to the onset of intervention. A trend analysis was carried out on the dependent measures collected during the baseline phases and at the start of each intervention session. The data are displayed on a graph for visual analysis of stability and trend across adjacent phases, and then analysed using the 2SD-band method (Portney & Watkins, 2009). First, the variability during the baseline phase was established using the mean and standard deviation of data points within that phase. The 2SD-band was extended into the intervention phase. If at least two consecutive data points in the intervention phase fell outside the 2SD-band, changes from baseline were considered significant (Portney & Watkins, 2009). Effect sizes were calculated by comparing performance in baseline (A) with the post-intervention baseline (AB) using a variation of Cohen’s *d* (small effect = .2-.5; medium effect = .5- .8; large effect = >.8; Beeson & Robey, 2006). For some participants, some of the mean and standard deviation of the repeated measures equalled zero, which did not allow use of the

2SD-band method, nor calculation of effect size. For those measures, the Percentage of Non-Overlapping Data (PND) was calculated (Tate, Perdices, Rosenkoetter et al., 2013). The PND value indicates the percentage of data points during intervention that exceed the most extreme data point in the baseline phase (Portney & Watkins, 2009). Higher PNDs indicate stronger effects (90% = very effective intervention; 70%–90% = effective intervention; 50%–70% = questionable; <50% = ineffective; Portney & Watkins, 2009). PND has been used in published research that evaluated the efficacy of oral narrative interventions (Petersen et al., 2010), however is considered less robust than the 2SD-band method (Parker, Vannest & Davis 2011).

IV Results

In this section, the data will be presented for all participants for all three hypotheses in tables. Figures for the repeated measures for one of the eleven participants (P11) will also be presented, to illustrate the 2SD-band method used as part of the statistical analysis for hypothesis 1 and 2. For figures for all 11 participants, on all experimental measures used in the study, see - <https://espace.curtin.edu.au/handle/20.500.11937/59145>).

Hypothesis 1

Hypothesis one, which predicted that participation in the ONIP would lead to significant improvement in *repeated measures of inclusion of narrative macrostructure* elements, i.e., TMSS (-previously described in the experimental measures section and in Table 2) was supported. Analysis using the 2-SD method revealed significant changes for seven of 11 participants. Effect sizes were calculated using a variation of Cohen's *d* statistic for single subject research designs (Beeson & Robey, 2006). Effect sizes ranged from moderate to large (table 5).

[INSERT TABLE 5]

Figure 2 depicts the TMSS for one participant (P11). The graph reveals a stable baseline, as all data points fell within three standard deviations of the mean, consistent with Statistical Process Control (SPC) definition of variability (Portney & Watkins, 2009). A slight overall positive trend is evident during baseline, with data points A6 and A8 falling above the mean line, and data point A9 falling above the 2SD-band. During the intervention phase, the TMSS indicates an overall positive trend from baseline to intervention, with 10 scores falling above the 2SD-band. A significant effect of intervention is thus demonstrated, as two consecutive data points fall above the 2SD-band during the intervention phase (B5 and B6).

[INSERT FIGURE 2]

Hypothesis 2

Hypothesis two, which predicted that participation in the ONIP would lead to significant improvement in the inclusion of narrative *microstructure* features, was partially supported. Significant change was demonstrated in inclusion of conjunctions and adverbials by eight, and

five, of the 11 participants respectively. Significant change was observed in fewer participants for adjectives (3), and no participants for complex C Units (0).

[INSERT TABLE 6]

Figures 3 to 6 below depict the Total Number of Conjunctions, Adverbials, Adjectives, and Complex C-units collected during baseline and intervention sessions (for P11). Visual inspection of the graphs, and statistical analysis using the 2SD-band method indicate a statistically significant effect for Total Number of Conjunctions, Adverbials and Adjectives. The 2SD-band was unable to be calculated for Complex C-units as the mean and standard deviation for the baseline was zero. Calculation of the PND revealed a score of 0%, confirming that the intervention was ineffective for Complex C-units.

[INSERT FIGURE 3]

[INSERT FIGURE 4]

[INSERT FIGURE 5]

]INSERT FIGURE 6]

While there was variability of scores across sessions for the participants, visual inspection of the graphs for those with a significant change, revealed overall positive trend from pre- to post-baseline (see Glisson, 2017 for further details).

Hypothesis 3

The third research question investigated the *clinical* effect of the ONIP, using a standardised measure - the Test of Narrative Language (TNL; Gillam & Pearson, 2004). The TNL provides a composite score (NLAI) of overall narrative ability, comprising both narrative comprehension and expression, and considered the most reliable score in the TNL (Gillam & Pearson, 2004). A clinically significant change is judged to occur if a participant's standardised score crosses at least one clinical boundary as defined by the test manual (i.e. from "Very Poor" to "Poor" or "Below Average" to "Average") (Gillam & Pearson, 2004).

Analysis of the NLAI scores (see table 7) reveals that nine of the 11 participants made *clinically* significant improvements, demonstrated by the move across clinical boundaries, with seven participants (P1, P3, P4, P5, P7, P10 & P11) moving into the "Average" range. Additionally, three of these participants (P3, P7 & P10) crossed two clinical boundaries, from "Poor" to "Average". Scores for P8 and P9 each shifted one clinical boundary (from "Very Poor" to "Poor", and "Poor" to "Below Average"), while P6 remained in the "Average" range. Scores for one participant (P2) remained at "Very Poor". P2's pre-intervention data revealed severe receptive and expressive vocabulary difficulties (PPVT-IV Standard Score = 30, EVT-2 Standard Score = 19), with narrative difficulties in the severe range (NLAI = 46).

[INSERT TABLE 7]

The summary of the broad outcomes for each hypothesis for each participant is summarised in Table 8 below.

[INSERT TABLE 8]

V Discussion

The ONIP, which included an explicit approach to narrative macrostructure (teaching scripts, icons, storyboards, and answering comprehension questions related to macrostructure elements), active engagement strategies, repeated telling and retelling of children's storybooks, and scripted implicit grammar facilitation strategies (repeated modelling, recasting, expansion and vertical structuring during retells) – was designed for 5-6-year old children attending a mainstream school with narrative difficulties. The research project aimed to evaluate the impact of such an approach on overall narrative abilities, and on the inclusion of narrative macrostructure and microstructure elements in narrative generations.

This study revealed that the ONIP resulted in a generalised improvement for nine of the eleven participants on a standardised assessment (TNL; Gillam & Pearson, 2004), indicating a clinically significant effect. Additionally, the results revealed statistically significant improvements with a moderate to large effect for seven of the eleven participants on inclusion of macrostructure elements. For the inclusion of microstructure features, the results were more varied. The ONIP resulted in a statistically significant effect for seven of the eleven participants on the number of conjunctions, and five of the eleven for adverbs, but only three improved in the total number of adjectives and none in complex C-units. This finding could be considered an artefact of the design of the narrative scripts, which included more examples of conjunctions and adverbs to link the events and actions, and less of adjectives and complex C-units. As such, this may have impacted on the frequency of these features being modelled to the participants, in turn impacting on the effectiveness of learning these targets.

1 Patterns of performance

Closer inspection of the individual profiles of participants prior to intervention revealed interesting patterns of performance. Participants with mild narrative difficulties, and age appropriate receptive and expressive vocabulary prior to intervention (P1, 4, 5 & 11), made the most change. All made clinically significant change in overall narrative ability as measured by the NLAI. P1 and P11 also demonstrated significant change for all repeated measures except Complex C-units, while P4 and P5 demonstrated significant change on two of the repeated measures.

Participants 3, 7, 9 and 10 presented with moderate narrative difficulties and age-appropriate receptive vocabulary skills prior to intervention. These participants also significantly improved on the NLAI, however the repeated measures data for narrative macrostructure and microstructure elements were more variable (with no improvements in Adjectives or Complex C-units for any of these participants). P7 made the most improvement with significant change in TMSS, Conjunctions, and Adverbials. P9 and P10 were EAL/D learners, and P9 had a mild expressive vocabulary difficulty prior to intervention (EVT-2 = 79). These two participants made less improvement than the monolingual English speakers in

this group (P3 and P7), with P9 demonstrating no significant improvement in the repeated measures. This could suggest that the ONIP in its current form is less effective for a child with expressive vocabulary difficulties and moderate narrative delay in EAL/D children. It is encouraging that all improved significantly on the TNL – demonstrating a positive response to the intervention. The more variable outcomes for the repeated measures suggest that children with moderate narrative difficulties may require higher dosage or more explicit teaching of certain targets. Future research could vary dosage and modify the explicit teaching of narrative targets with a larger group of participants.

Two children presented with a severe narrative difficulty prior to treatment (P2 and P8). P8 was an EAL/D learner, with severe NLAI score, borderline PIQ and expressive vocabulary, with average receptive vocabulary prior to intervention. P8 demonstrated significant change in NLAI, TMSS and Conjunctions, a positive effect of treatment for three of the six measures, despite minimal exposure to English at the time of the ONIP. P2, however, presented with a more severe language profile. Prior to intervention, P2 had the lowest TNL score (NLAI = 46), and PPVT-IV and EVT-2 standard scores fell within the severe range (SS = 30 and 19 respectively). Additionally, case history revealed a history of language delay, a history of neglect and she was an EAL/D speaker. P2 did not demonstrate significant improvement in any of the repeated measures, and while her scaled score on the TNL increased, it did not show clinically significant change. This suggests that the overall amount, and perhaps the type, of intervention (small group), may not have been appropriate for P2. Children who present with a more severe profile overall may require increased dosage, more explicit teaching of both macro- and microstructure targets, and/or the inclusion of intervention targets more tailored to their language disorder. This should be investigated in future efficacy studies.

The results from this study provides further evidence for oral narrative interventions that focus on the explicit teaching of macrostructure using graphic organisers and icons, and repeated telling and retelling of stories for improving overall narrative abilities and macrostructure skills. Recent published evidence investigating narrative-based language intervention for pre-school (Petersen & Spencer, 2016) and school-age children (Gillam & Gillam, 2016) with language difficulties, supports this conclusion. The intervention programmes in these studies – Story Champs (Spencer & Petersen, 2012) and SKILL (Gillam et al, 2012), have many similarities with the ONIP, including the use of icons and graphic organisers to teach macrostructure, and repeated opportunities for story telling using picture prompts.

All three programmes also target morphosyntax (microstructure), although there are differences in the target populations and in the approach to microstructure (particularly grammar) intervention (Glisson, 2017). Both SKILL and Story Champs include explicit intervention for vocabulary and morphosyntax, while the ONIP used language facilitation techniques, a more implicit approach, to target microstructure (Glisson, 2017). The findings of these studies, in combination with those of the present study, indicate that while *implicit* grammar facilitation within a narrative context *may* be effective for children with mild narrative difficulties and no significant language or cognitive impairments, it may be less effective for pre-school and school-age children with more severe language difficulties. As such, further research should explore the effectiveness of an *explicit* approach for these children.

2 Limitations and future directions

A small scale SSRD provided preliminary evidence for the ONIP. The SSRD involved more than the minimum of three participants, and a stable baseline was established for each participant with at least three data points. However, post-intervention assessment was not completed by a blind assessor, no maintenance data was collected, and inter-rater reliability measures were only calculated for 7.5% of the data (Risk of Bias in N-of-1 Trials; Tate et al., 2013). The elicitation procedure used in the study has not yet been validated. At the time the study commenced, there was no assessment procedure that elicited oral narrative generations from single pictures.

For some repeated measures created for the study (number of complex C-units, adjectives and adverbials), some of the participants scored a mean and standard deviation of zero during phase A, hence the 2SD-band statistic could not be calculated, requiring use of the less robust measure of Percentage of Non-overlapping Data (Tate et al., 2013). Future studies should consider the sensitivity of the coding procedure used in this study in a repeated measures design. Recent advances in assessment and monitoring procedures for oral narrative have resulted in additional resources available to the clinician and researcher, including the Narrative Language Measure (NLM; Petersen & Spencer, 2012), and the Monitoring Index of Scholarly Language (MISL; Gillam & Gillam, 2013), which have been demonstrated to be more sensitive to evaluating change, and could be considered for future research evaluating the ONIP. In addition, it would be useful to consider the use of other narrative elicitation approaches (such as retells), and other genres (such as procedures) to measure generalisation and microstructure changes.

In the evaluation of clinical outcomes, Portney and Watkins (2009) suggest that in addition to demonstrating effectiveness during an experimental study, evidence of external validity is also required. External validity includes evidence that the effects of intervention can be generalised to other individuals with similar characteristics and other conditions that differ from the experimental conditions, and that the effects are sustained after the intervention has ended. To further the external validity of this study, systematic replication is recommended, using a larger sample size, and including a control group for comparison. Future studies should also include children with developmental language disorder to evaluate the efficacy of the ONIP or a modified version of the ONIP with this population.

VI Conclusion

The present study provides support for the use of a narrative intervention approach that focuses on the explicit teaching of narrative macrostructure elements using icons, gestures and graphic organisers, and the repeated telling and retelling of stories, for improving narrative skills. Additionally, this study investigated the impact of the ONIP on the development of microstructure skills (vocabulary and morpho-syntax) using scripted implicit therapeutic procedures such as modelling, recasting, expansion and vertical structuring. (This level of detail in the ONIP manual makes replication of the intervention easier for clinicians and educators). The results indicate that the ONIP was effective in improving the inclusion of macrostructure elements, and some measures of microstructure (conjunctions and adverbs), but not in others (complex C-units and adjectives). This suggests that these more complex syntax skills may need to be targeted in a more explicit manner. Importantly, the ONIP resulted in a generalised improvement for participants with mild-moderate co-occurring language

difficulties on a standardised assessment (TNL; Gillam & Pearson, 2004), indicating a clinically significant effect.

The full details of the ONIP are freely available for clinicians and educators to use from (<https://espace.curtin.edu.au/handle/20.500.11937/59145>) and the full programme is freely downloadable from (<https://www.languageandliteracyinyoungpeople.com>).

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Declaration of conflicting interest

The Authors declare that there is no conflict of interest.

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Notes

1. While SALT was used to code the samples in this study, clinicians could code the presence of the macro and micro structures using the checklists provided without using SALT.

References

- Australian Curriculum, Assessment and Reporting Authority. (2015). *English: Sequence of content F-6 Strand: Language*. Australian Curriculum, v8.1.
- Applebee, A. N. (1978). *The child's concept of story - ages two to seventeen*. Chicago, IL: University of Chicago.
- Beeson, P. M., & Robey, R. R. (2006). Evaluating single-subject treatment research: Lessons learned from the aphasia literature. *Neuropsychological Review*, 16(4), 161-169.
- Colozzo, P., Gillam, R., Wood, M., Schnell, R., & Johnston, J. (2011). Content and form in the narratives of children with Specific Language Impairment. *Journal of Speech, Language, and Hearing Research* 54, 1609-1627.
- Dunn, L. M., & Dunn, D. M. (2007). *Peabody Picture Vocabulary Test, Fourth Edition*. USA: Pearson.
- Ebbels, S. (2014). Effectiveness of intervention for grammar in school-aged children with primary language impairments: A review of the evidence. *Child Language Teaching and Therapy*, 30(1), 7–40.
- Ebbels, S. H., McCartney, E., Slonims, V.B., Dockrell, J.E., & Norbury, C. (2019). Evidence based pathways to intervention for children with language disorders. *International Journal of Language Communication Disorders*, 54(1), 3–19, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/1460-6984.12387>.
- 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

- 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.
- Fisher, D. & N. Frey. (2008). *Better learning through structured teaching: A framework for the Gradual Release of Responsibility*. Association for Supervision and Curriculum Development. Alexandria: Virginia.
- Gillam, S., & Gillam, R. (2013). *Monitoring indicators of scholarly language (MISL)*. Logan: Utah State University.
- Gillam, S., & Gillam, R. (2016). Narrative discourse intervention for school-aged children with language impairment: Supporting knowledge in language and literacy. *Topics in Language Disorders, 36*(1), 20-34.
- Gillam, S., Gillam, R., & Laing, C. (2012). *Supporting Knowledge in Language and Literacy (SKILL)* (Curriculum guide to teaching narratives with DVD manual, and progress monitoring tools). Logan, UT: Utah State University, Commercial Enterprises.
- Gillam, R. B., & Pearson, N. A. (2004). *Test of Narrative Language*. Austin, TX: Pro-Ed.
- Glisson, L. (2017). A study to measure the efficacy of a manualised oral narrative intervention programme for school-age children with narrative delay. Curtin University, <https://espace.curtin.edu.au/handle/20.500.11937/59145>
- Knowles, S., & Clement, R. (1996). *Edwina the emu*. Pymble, N.S.W.: Angus & Robertson.
- Lynch, J. S., van den Broek, P., Kremer, K. E., White, M. J., & Lorch, E. P. (2008). The development of narrative comprehension and its relation to other early reading skills. *Reading Psychology, 29*, 327-365.
- Miller, J., & Iglesias, A. (2008). *Systematic Analysis of Language Transcripts (SALT)* [Computer Software]: LLC.
- Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect size in single-case research: A review of nine nonoverlap techniques. *Behavior Modification, 35*(4), 303-322.
- Paul, R. (1995). *Language disorders from infancy through adolescence*. St Louis, MO: Mosby.
- Pearce, M., Williams, C., & Steed, W. (2015). Dialectal grammatical differences in oral narratives of school-aged Indigenous Australian children. *International Journal of Speech-Language Pathology, 17*(4).
- Petersen, D. (2010). A systematic review of narrative-based language intervention with children who have language impairment. *Communications Disorders Quarterly, 32*(4), 207-220.
- Petersen, D., & Spencer, T. (2012). The Narrative Language Measures: Tools for language screening progress monitoring, and intervention planning. *Perspectives on Language Learning and Education, 19*(4), 119-129.
- Petersen, D., & Spencer, T. (2016). Using narrative intervention to accelerate canonical story grammar and complex language growth in culturally diverse pre-schoolers. *Topics in Language Disorders, 36*(1), 6–19.
- Portney, L. G., & Watkins, M. P. (2009). *Foundations of clinical research: Applications to practice* (3 ed.): Pearson Education.
- Sedgwick, P. (2014). Clinical significance versus statistical significance. *BMJ, 348*(g2130).
- Stein, N., & Glenn, C. (1979). *An analysis of story comprehension in elementary school children*. Hillsdale, NJ: Erlbaum.
- Tate, R. L., Perdices, M., Rosenkoetter, U., Wakim, D., Godbee, K., Togher, L., & McDonald, S. (2013). Revision of quality rating scale for single-subject experimental design and n-of 1

- trials: The 15-item Risk of Bias in N-of-1 Trials (RoBiNT) Scale. *Neuropsychological Rehabilitation*, 23(5), 619–638, <http://dx.doi.org/10.1080/09602011.2013.824383>
- 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.
- Wechsler, D. (1989). *Wechsler Preschool and Primary Scale of Intelligence-Revised*. San Antonio, TX: The Psychological Corporation.
- Westby, C. E. (1985). Learning to talk - talking to learn: Oral literate language differences. In C. Simon (Ed.), *Communication skills and classroom success: Therapy methodologies for language-learning disabled students* (pp. 181-213). San Diego, CA: College-Hill.
- Williams, K. T. (2007). *Expressive Vocabulary Test, Second Edition*. USA: Pearson.

Table 1. Demographic and case history information, pre intervention language and cognitive data.

P	Gender	Age at pre-testing (years;months)	Background Information	TNL-NLAI	EVT-2 SS	PPVT-IV SS	WPPSI PIQ SS
1	Male	5;6	Monolingual	85*	100	106	98
2	Female	5;1	History of language delay and neglect	46*	19*	30*	86
3	Female	5;0	Monolingual	73*	99	110	93
4	Male	5;6	Monolingual	82*	109	112	105
5	Male	5;1	Monolingual	85*	94	105	102
6	Female	5;3	Monolingual	91	103	104	95
7	Male	5;4	Monolingual	73*	101	99	72*
8	Female	5;8	EAL/D, 3 months exposure to English	55*	79*	99	79*
9	Male	5;3	Multilingual, exposed to English since birth	70*	79*	99	84*

10	Male	5;3	Multilingual, exposed to English for more than 12 months	70*	107	98	84*
11	Male	5;11	Monolingual	88*	99	99	81*

Notes. P = Participant; * = performance below normal range; EAL/D = English and an Additional Language/Dialect; SS = standard score; TNL = Test of Narrative Language; NLAI = Narrative Language Ability Index; NLAI Clinical Descriptions = >130 = very superior, 121-130 = superior, 111-120 = above average, 90-110 = average; 80-89 = below average, 70-79 = poor, <70 = very poor; PPVT-IV = Peabody Picture Vocabulary Test, fourth edition; EVT-2 = Expressive Vocabulary Test, second edition; WPPSI = Wechsler Preschool and Primary Scale of Intelligence, PIQ = Performance (nonverbal) IQ.

Table 2. Repeated measures macrostructure and microstructure scores.

Repeated Measure	Code and description
Total macrostructure score	Composite score of all individually coded macrostructure elements – Orientation of Setting [OS], Orientation of Character [OC], Initiating Event [IE], Internal Response [IR], Plan [P], Actions/Attempts [A], Complication [Comp], Solution [S], Consequence [C], Formulaic Markers [Form], Character Speech [Speech]
Total number of conjunctions	Composite score of conjunctions included in the narrative – Temporal Conjunctions [TC], Additive Conjunctions [AC], Conditional Conjunctions [CondC], Adversative Conjunctions [AdC], Causal Conjunctions [CC]
Total number of adverbials	Composite score of all adverbials including adverbials of place [AP], time [AT] and manner [AM].
Total number of Adjectives	[ADJ] Total number of adjectives included, providing a measure of descriptive vocabulary.
Total number of Complex C-units	[COMPLEX] Total number of C-units containing an independent clause and at least one dependent clause.

Note. [] code.

Table 3. ONIP phase one intervention structure

Session	Intervention Focus
1	Introduction to overall narrative macrostructure. Book 1: Wombat Stew.
2	Explicit teaching of setting (when, who, where) – key focus ‘who’. Book 1: Wombat Stew.
3	Explicit teaching of setting (when, who, where) – key focus ‘where’. Book 2: Monkey Do!
4	Explicit teaching of setting (when, who, where) – key focus ‘when’. Book 3: The Very Hungry Caterpillar.
5	Explicit teaching of central plot - ‘initiating event’, ‘internal response’ and ‘plan’. Book 4: Edwina the Emu.
6	Explicit teaching of ‘actions/attempts’ in the middle of the story. Book 1: Wombat Stew.
7	Explicit teaching of central plot - ‘initiating event’, ‘internal response’ and ‘plan’. Book 4: Edwina the Emu.
8	Explicit teaching of story ending - ‘solution/resolution’ and ‘consequence’. Book 4: Edwina the Emu.
9	Consolidation of overall narrative macrostructure. Book 4: Edwina the Emu.

Table 4. ONIP phase two intervention structure

Session	Intervention Focus
10 -12	Book 5: Rhino's Great Big Itch <ul style="list-style-type: none">• First session: Book share protocol, story board, modelled and shared retell with visual and gestural support.• Second session: Book share protocol, picture sequencing and recalling text, modelled, shared and individual retell with visual and gestural support• Third session: Book share protocol, picture sequencing and recalling text, modelled, shared and individual retell with visual and gestural support.
13-15	Book 6: The Very Cranky Bear (session structure as above)
16-18	Book 7: Possum Magic (session structure as above)

Table 5. Total Macrostructure Scores (TMSS)

P	Baseline Phase Mean (SD)	Significance (2SD-Band)	Effect Size Cohen's <i>d</i>	Hypothesis Confirmed / Unconfirmed
1	4.46 (2.31)	Significant	1.73	Confirmed
2	6.67 (3.36)	Non-significant	1.59	Unconfirmed
3	13.0 (6.2)	Non-significant	-0.60	Unconfirmed
4	6.0 (2.8)	<i>(PND = 40%)</i>		Unconfirmed
5	4.3 (2.2)	Significant	1.41	Confirmed
6	10.17 (5.49)	Significant	0.39	Confirmed
7	5.83 (3.03)	Significant	0.71	Confirmed
8	2.5 (1.56)	Significant	1.41	Confirmed
9	4.56 (1.42)	Non-significant	0.58	Unconfirmed

10	15.44 (4.4)	Significant	3.82	Confirmed
11	11.22 (3.3)	Significant	2.42	Confirmed

Notes. P = Participant; shaded section = not applicable; Cohen's $d = .2-.5$ = small effect; $.5-.8$ = medium effect; $>.8$ = large effect; PND = Percentage of Non-Overlapping Data = PND, 90% = very effective; 70%–90% = effective; 50%–70% = questionable; $<50%$ = ineffective.

Table 6. Total Number of Conjunctions, Adverbials, Adjectives, and Complex C-units.

P	Total Number of Conjunctions			Total Number of Adverbials			Total Number of Adjectives			Total Number of Complex C-units		
	Baseline Mean (SD)	Sig (2SD-Band)	Cohen's d	Baseline Mean (SD)	Sig (2SD-Band)	Cohen's d	Baseline Mean (SD)	Sig (2SD-Band)	Cohen's d	Baseline Mean (SD)	Sig (2SD-Band)	Cohen's d
1	3.0 (0.82)	S	4.49	1.00 (0.82)	S	2.45	0.67 (0.94)	S	1.41	0.00 (0.00)	<i>(PND = 43.75%)</i>	

2	3.67 (2.05)	NS	1.30	1.33 (1.25)	NS	0.82	0.00 (0.00)	<i>(PND = 41.67%)</i>		0.00 (0.00)	<i>(PND = 0%)</i>	
3	1.33 (0.94)	S	6.01	0.00 (0.00)	<i>(PND = 92.86%)</i>		0.00 (0.00)	<i>(PND = 42.9%)</i>		0.00 (0.00)	<i>(PND = 50%)</i>	
4	3.67 (0.94)	S	4.95	2.00 (1.41)	S	1.41	0.00 (0.00)	<i>(PND = 26.67%)</i>		0.67 (0.47)	NS	0.00
5	2.25 (0.83)	S	2.91	1.00 (0.71)	NS	0.94	0.00 (0.00)	<i>(PND = 18.75%)</i>		0.25 (0.43)	<i>(PND = 0%)</i>	
6	4.83 (1.46)	S	-0.34	1.33 (1.37)	S	1.21	1.17 (1.34)	S	2.11	0.33 (0.75)	<i>(PND = 6.67%)</i>	
7	2.33 (1.49)	S	1.57	0.83 (0.90)	S	0.19	0.67 (0.75)	NS	2.68	0.00 (0.00)	<i>(PND = 41.18%)</i>	
8	0.83 (0.90)	S	0.55	0.00 (0.00)	<i>(PND = 45%)</i>		0.00 (0.00)	<i>(PND = 6.25%)</i>		0.00 (0.00)	<i>(PND = 12.5%)</i>	
9	2.11 (1.20)	NS	-0.09	1.00 (1.05)	NS	0.00	0.33 (0.47)	NS	0.00	0.00 (0.00)	<i>(PND = 0%)</i>	
10	12 (5.14)	NS	0.39	3.56 (2.41)	NS	-0.65	3.89 (3.84)	NS	0.29	0.11 (0.31)	<i>(PND = 0%)</i>	
11	8.67 (3.06)	S	2.40	1.33 (0.82)	S	2.04	1.89 (1.73)	S	1.61	0.00 (0.00)	<i>(PND = 0%)</i>	

Notes. P = Participant; shaded section = not applicable; Cohen's d = .2-.5 = small effect; .5- .8 = medium effect; >.8 = large effect; PND = Percentage of Non-Overlapping Data = PND, 90% = very effective; 70%–90% = effective; 50%–70% = questionable; <50% = ineffective, S = significant, NS = non-significant.

Table 7. Pre- post intervention TNL - NLAI scores

P	Age (years;months)		NLAI		Percentile Rank		Clinical Category		Hypothesis Confirmed / Unconfirmed
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
1	5;6	5;9	85	106	16	65	Below Ave	Ave*	Confirmed
2	5;1	5;5	46	61	<1	<1	Very Poor	Very Poor	Unconfirmed
3	5;0	5;2	73	103	3	58	Poor	Ave**	Confirmed
4	5;6	5;10	82	94	12	35	Below Ave	Ave*	Confirmed
5	5;1	5;5	85	91	16	27	Below Ave	Ave*	Confirmed
6	5;3	5;6	91	97	27	27	Ave	Ave	Unconfirmed
7	5;4	5;7	73	91	3	27	Poor	Ave**	Confirmed
8	5;8	6;1	55	73	<1	3	Very Poor	Poor *	Confirmed
9	5;3	5;6	70	85	2	16	Poor	Below Ave*	Confirmed
10	5;3	5;6	70	106	2	65	Poor	Ave**	Confirmed
11	5;11	6;1	88	106	21	65	Below Ave	Ave*	Confirmed

Notes. P = Participant; TNL = Test of Narrative Language; NLAI = Narrative Language Ability Index; NLAI descriptions = >130 = very superior, 121-130 = superior, 111-120 = above average, 90-110 = average; 80-89 = below average, 70-79 = poor, <70 = very poor; Ave = Average; * = shift in one clinical boundary; ** = shift in two clinical boundaries.

Table 8. Summary of hypotheses (confirmed or unconfirmed)

P	(H1)	(H2)	(H3)			
	TNL – NLAI	TMSS	Conjunctions	Adverbs	Adjectives	Complex C-units
1	✓	✓	✓	✓	✓	✗
2	✗	✗	✗	✗	✗	✗
3	✓	✗	✓	✓	✗	✗
4	✓	✗	✓	✓	✗	✗
5	✓	✓	✓	✗	✗	✗
6	✗	✓	✓	✓	✓	✗
7	✓	✓	✓	✓	✗	✗
8	✓	✓	✓	✗	✗	✗
9	✓	✗	✗	✗	✗	✗
10	✓	✓	✗	✗	✗	✗
11	✓	✓	✓	✓	✓	✗
Total	9/11	7/11	8/11	6/11	3/11	0/11

Notes. P = participant; H1 = Hypothesis One; H2 = Hypothesis Two; H3 = Hypothesis Three; TNL = Test of Narrative Language; NLAI = Narrative Language Ability Index; Macro = Macrostructure; ✓ = hypothesis confirmed = moved clinical boundary/ies, significance using 2SD-band method or PND >70%; ✗ hypothesis unconfirmed = did not move a clinical boundary, non-significance using 2SD-band method or PND <70%.

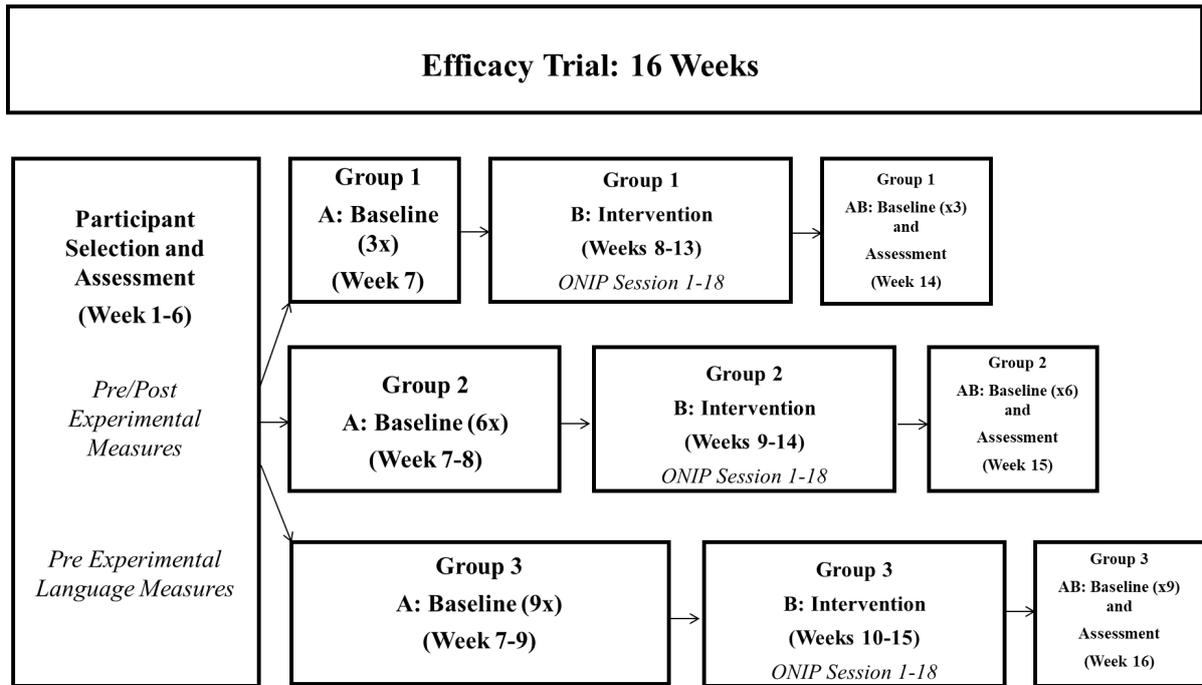


Figure 1. Experimental Design

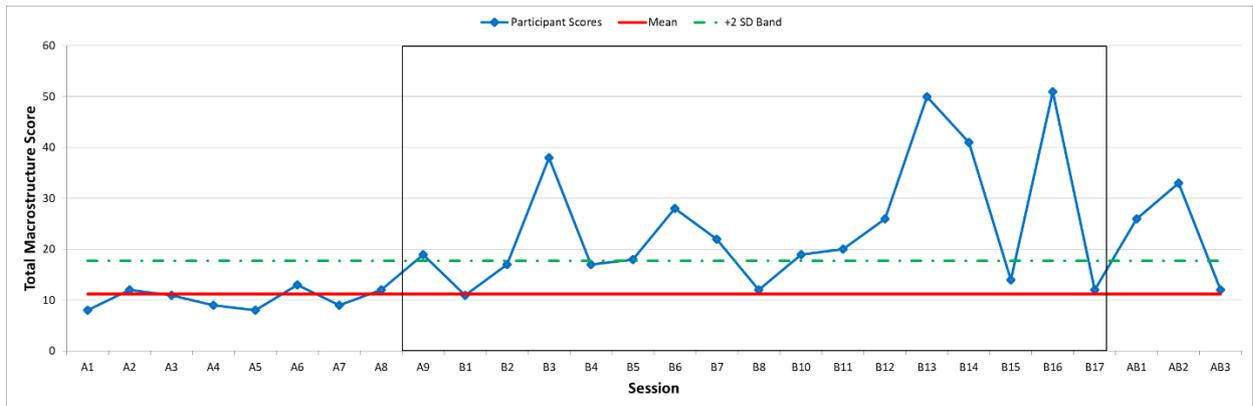


Figure 2. TMSS for P11 during baseline (A1-6), intervention (B1-18), and post-intervention (AB1-3). Boxed area = intervention phase.

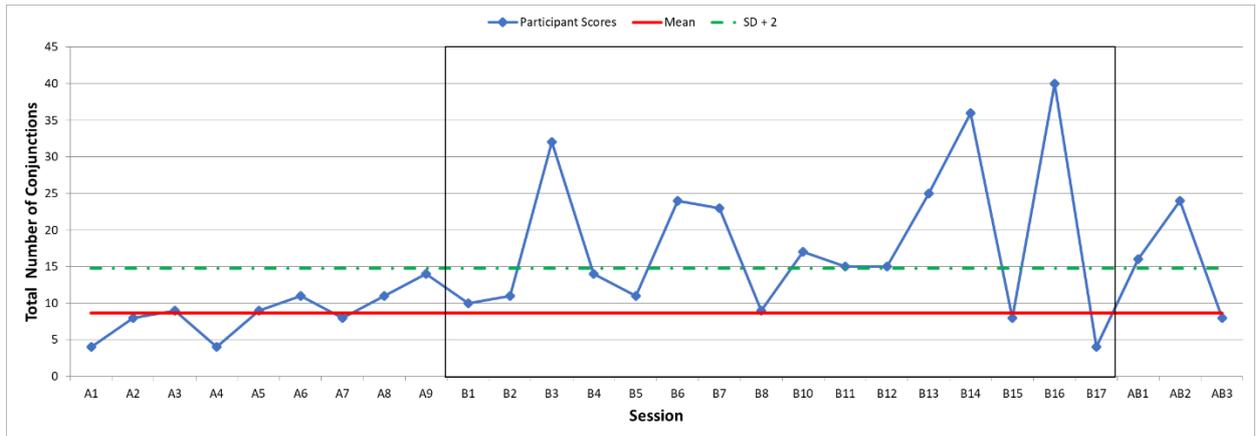


Figure 3. Total Number of Conjunctions for P11 during baseline (A1-6), intervention (B1-18), and post- intervention (AB1-3). Boxed area = intervention phase.

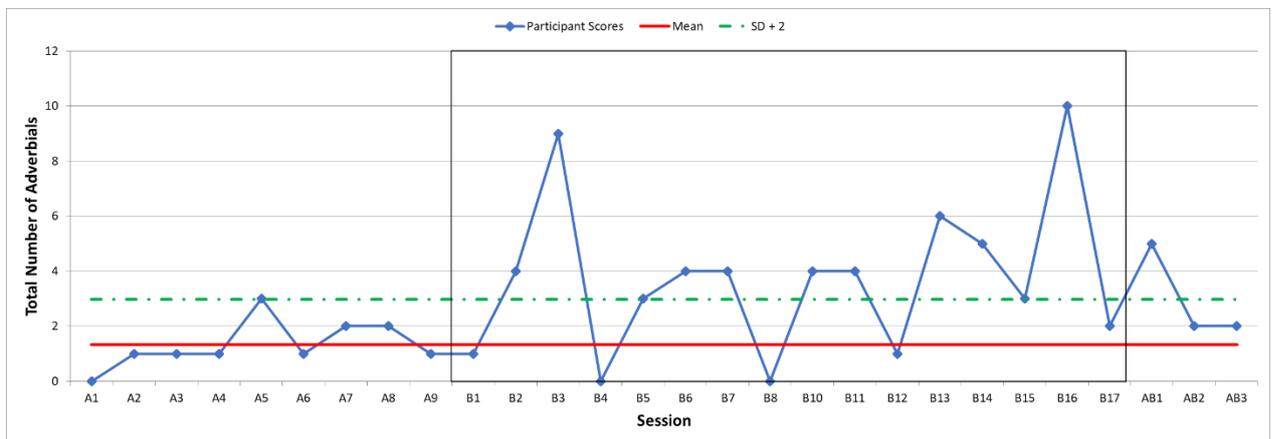


Figure 4. Total Number of Adverbials for P11 during baseline (A1-6), intervention (B1-18), and post- intervention (AB1-3). Boxed area = intervention phase.

