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Personal narrative intervention for school-age children with Down syndrome:

A focus on macrostructure

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Abstract

The ability to narrate past personal events is important for classroom participation and socio-emotional wellbeing. Although school-age children with Down syndrome show significant challenges producing personal event narratives, there is little research to guide personal narrative intervention. This study used a single subject experimental design to investigate the effectiveness of a personal narrative intervention program aimed at enhancing children's ability to include narrative elements when sharing a personal narrative. Eight children with Down syndrome participated in two intervention sessions a week over 7 weeks. Progress was measured as inclusion of narrative elements in response to three types of prompts: an open prompt, the child's own photo, and a generic photo of children engaged in a familiar activity. Parents completed a post-intervention survey to determine social validity and feasibility. Following intervention, five participants demonstrated significant progress on the open prompt, whereas three participants failed to make significant progress on any of the prompts. Although the results highlight the feasibility of the intervention and demonstrate the effectiveness for at least five of the participants, recommendations are provided to guide further work in this important area to help facilitate social inclusion for this group of children.

Introduction

More than half of children's conversations involve producing personal event narratives (Peterson and McCabe, 1983), which can be defined as accounts of personally experienced events. As explained by Westby and Culatta (2016), personal narrative competence supports social interactions and is associated with social and psychological wellbeing. Furthermore, the ability to produce coherent personal event narratives is important for participation in school and for accessing the curriculum. At school, children are expected to recount experiences, draw on personal experiences when reading texts, and produce personal narratives in writing tasks (Australian Curriculum Assessment and Reporting Authority [ACARA], 2012; Milosky, 1987; Ministry of Education, 2007; Department for Education, 2013). One group of children who attend mainstream schools [withheld] are children with Down syndrome. Considering the importance of personal narrative proficiency for social interactions, classroom participation, and access to the curriculum, it is of great concern that many of these children demonstrate significant difficulties producing past personal event narratives (van Bysterveldt et al., 2012; van Bysterveldt and Westerveld, 2017). The current study therefore investigated the effectiveness of a personal narrative intervention program for school-age children with Down syndrome.

To produce a coherent personal event narrative requires the narrator to use adequate language skills at microstructure level to convey the content of the narrative (i.e. use of vocabulary and grammatical structures). At macrostructure level the narrator needs to include essential narrative elements (to provide the listener with information about who was involved, where and when the event occurred, and what happened), organise the narrative content, and contextualise the narrative so that the significance of the narrative is conveyed (Labov, 1999). One common approach to evaluating personal narratives at macrostructure level is high point analysis (Peterson and McCabe, 1983), with the high point referring to the climax or the *point* of the story. Based on this coding scheme, the most coherent personal narrative is the classic narrative, which contains at least two past events that are chronologically sequenced, is centred around a 'high point', and has a clear resolution.

Past research into the narrative skills of children with Down syndrome has mainly focused on fictional narratives (e.g. Channell, 2020; Channell et al., 2015; Cleave et al., 2012). However, personal narrative and fictional narrative discourse are two distinct genres (McCabe et al., 2008), with research involving children with language disorders revealing significant differences in performance on measures of microstructure (length) and macrostructure (high point analysis) despite using the same type of analysis across these two genres. Moreover, the results revealed that the quality of a child's performance in one genre was only mild-moderately correlated with the child's performance on the other genre. Relatively few studies have investigated the personal narrative skills of children with Down syndrome (Finestack et al., 2017; van Bysterveldt et al., 2012; van Bysterveldt and Westerveld, 2017, for a review see Segal and Pesco, 2015), which is surprising considering the high importance parents place on their school-age children's ability to participate successfully in social communication (van Bysterveldt et al., 2019). Van Bysterveldt et al. (2012) described the personal narrative skills of 25 children with Down syndrome (aged 5 years, 11 months to 13 years, 11 months), and found that although more than 90% of the participants responded to the personal narrative prompts, only one child (4%) produced a classic narrative, and three children produced a narrative containing a high point (12%). Correlational analyses indicated significant associations between microstructure skills including syntax (mean length of utterance [MLU]), and semantics (number of different words), and children's performance at macrostructure level (using a high point analysis coding scheme), indicating that higher quality narratives (using high point analysis) contained longer sentences and higher semantic diversity. Although the direction of this relationship between micro- and macrostructure skills was not investigated by van Bysterveld et al. (2012), it seems plausible that children's challenges in microstructure skills may significantly hamper their ability to produce a well-structured cohesive narrative at macrostructure level (e.g. Boudreau and Chapman, 2000; Channell et al. 2015).

To our knowledge only one previous study has specifically evaluated the effectiveness of personal narrative intervention for school-age children with Down syndrome (Finestack et al., 2017). Finestack et al. (2017) implemented a 6-week personal narrative intervention program (18 sessions;

30-60 mins each) with four children with Down syndrome, aged 10 years, 1 month to 15 years, 4 months. The intervention contained grammatical goals (elaborated noun phrases, advanced verb phrases, conjunctions) as well as macrostructure goals (who, what, and where/when), with each session targeting one grammatical and one macrostructure goal. Finestack et al. (2017) utilized a single subject, multiple baseline across participants design and reported percentage of nonoverlapping data (PND) as an indicator of improvement. “This metric [PND] is conceptualized as the percentage of treatment phase data that exceeds a single noteworthy point within the baseline phase” (Lenz, 2013, p.66). As reported in Lenz (2013), PND < 50% indicates the intervention is non-effective, 50 – 69% is debatably effective, PND between 70 - 89% is effective, and an effect size of > 90% indicates a very effective treatment. Applying these effect sizes, one participant in Finestack et al.’s (2017) study made no improvement on any of the outcome measures (MLU; percentage of personal narrative utterances; Index of Narrative Complexity; Inclusion of Who, What, Where, and When), with PND ranging from 0% to 47%. One participant only showed gains on percentage of narrative utterances (PND 65%); one showed gains only on MLU (PND 59%); and the final participant showed gains on Inclusion of Who, What, Where, and When (PND 61 – 67%). Despite these inconsistent findings, Finestack et al. (2017) concluded the intervention seemed feasible and that further research was needed to help determine dosage and materials.

The current investigation builds on the study results from Finestack et al. (2017) in several ways. Based on previous studies (van Bysterveldt et al., 2012; van Bysterveldt and Westerveld, 2017) showing the extensive difficulties of children with Down syndrome in producing personal narratives containing at least two past tense events and a high point, the focus in the current study was on macrostructure only (inclusion of narrative elements) as opposed to a combination of grammatical and macrostructure goals. Previous research has indicated that building ‘story structure’ first may facilitate skills at microstructure level including complex language use (see Spencer and Petersen, 2020). Another variation is the inclusion of a peer, once a week, to promote social interaction and encourage generalization to people beyond the interventionists. Similar to Finestack et al. (2017) we made extensive use of visual supports, including the children’s own photos, a generic set of photos, and

story maps. We incorporated three different types of prompts (open prompt, generic photo prompts, child's own photos) to elicit the personal narratives. The following research question was asked:

Does a 7-week personal narrative intervention lead to significant improvements in personal narrative structure as measured by the inclusion of personal narrative elements?

We anticipated medium improvements in the participants' ability to include personal narrative elements when narrating a personal narrative as a result of focusing on story structure as opposed to targeting both microstructure and macrostructure goals (as in Finestack et al., 2017). Based on previous research, we did not expect to find significant differences between the different types of prompts (child's own photos vs generic photo prompts) in eliciting personal narrative elements (van Bysterveldt and Westerveld, 2017). To investigate the social validity of this intervention we also asked the parents to complete a brief survey after the intervention was completed.

Method

Participants

Ethical clearance was obtained from the University Educational Research Human Ethics Committee. Participants were recruited through personal networks and through the local branch of the New Zealand Down Syndrome Association and met the following inclusion criteria, based on parent report: a) diagnosis of Down syndrome; b) speak in short phrases (i.e. more than single words); c) be mostly intelligible to strangers; d) English as the primary language spoken at home. Eleven parents expressed an interest, but two parents withdrew before the intervention commenced because of other commitments, and one child participated in the intervention but her results are not included because of a very low Percentage Consonants Correct (PCC) at the pre-assessment (PCC 30%). Therefore, the results from 8 children (aged 8 years, 1 month to 13 years, 10 months) are reported.

Procedures and Design

The study used an A-B, across participants and prompts, single subject experimental design. This design is appropriate for early stage effectiveness studies and allows for detailed evaluation of

responders and non-responders (Horner et al., 2016). Due to scheduling constraints (i.e. university calendar), all participants commenced intervention at the same time. All assessments and intervention sessions were administered by third year undergraduate students in speech-language therapy (referred to as student clinicians), under supervision of the authors. All sessions were video-recorded for implementation fidelity and analysis purposes. While participating in this study, the participants did not receive any additional speech therapy intervention.

Measures

Baseline assessment sessions. The following tests were administered to describe the participants' cognitive, speech, language, and communication abilities, with the results shown in Table 1.

Children's receptive vocabulary was assessed using the *Peabody Picture Vocabulary Test – 4th Edition* (PPVT-4; Dunn and Dunn, 2007). Standard scores and age-equivalents are reported.

Primary Test of Nonverbal Intelligence (PTONI; Ehrler and McGhee, 2008). The PTONI was administered to obtain an indication of nonverbal cognitive ability. This test contains minimal oral directions and requires only a pointing response. The test is normed for children aged 3 years, 0 months to 9 years, 11 months. Age equivalents are reported because of floor effects for two participants.

Parents were asked to complete the Communication domain of the *Vineland Adaptive Behavior Scales – 2nd Edition* (VABS-II; Sparrow et al., 2005). This test is a standardised measure of adaptive behaviour (birth to age 90), used to determine the participants' communication skills in everyday situations. This test was used as opposed to direct standardized assessments due to floor effects often found on such tests with this population (e.g. Channell et al., 2015; Finestack et al., 2017). Both standard scores and age equivalents are reported.

Table 1

Participant Characteristics (ordered by PPVT-AE)

No	Age	DEAP PCC	PPVT SS	PPVT AE	PTONI AE	VABS SS	VABS AE	MLU	%intell words	%intell utterances
1B	10;0	49.46	20	2;6	2;11	72	3;2	1.44 [#]	50.60%	40.50%
2H	8;01	84	37	2;6	DNC	61	2;6	1.95	76.10%	54.70%
3G	8;04	83.2	34	2;9	2;7	65	2;10	1.0 [#]	67.30%	60.50%
4F	11;09	54.07	35	3;11	2;8	61	3;2	3.19	93.70%	80.60%
5E	8;03	67	61	4;4	4;7	74	4;6	3.37	83.10%	52.60%
6D	10;02	90.4	57	5;5	5;0	72	4;5	5.8	94.80%	73.20%
7A	13;10	83.7	46	5;7	5;0	65	4;4	3.57	95.30%	82.20%
8C	11;04	91.4	68	6;8	5;7	81	5;7	7.20 [#]	98%	86.20%

Age in Years; Months; DEAP PCC: Diagnostic Evaluation of Articulation and Phonology, Percentage Consonants Correct; PPVT: Peabody Picture Vocabulary Test; PTONI: Preschool Test of Nonverbal Intelligence; VABS: Vineland Adaptive Behavior Scales; MLU: Mean Length of Utterance, based on complete and intelligible utterances only; SS: Standard Score; AE: Age equivalent. DNC: Did not complete. [#] produced < 50 utterances

The phonology subtest from the *Diagnostic Evaluation of Articulation and Phonology* (DEAP; Dodd et al., 2002) was administered and the percentage consonants correct (PCC) was calculated, as per the manual.

A conversational *language sample* was collected, either using a set protocol (Westerveld and Gillon, 2002), or during play, with the aim of eliciting at least 50 utterances, which were transcribed using standard Systematic Analysis of Language Transcripts (SALT) conventions (Miller et al., 2018). Mean Length of Utterance in Words (MLU-W) of the complete and intelligible utterances was calculated automatically, using SALT, as well as the percentage of intelligible utterances and the percentage of intelligible words.

Baseline, Intervention, and Post-intervention Probes. Prior to the intervention, all families were asked to email 10 family photos depicting their child engaged in an activity (e.g. holidays, sports, hobby, family celebration). We also used a range of ‘generic’ photos depicting children engaged in daily activities, including the original personal narrative protocol photos (Westerveld and Gillon, 2002). All photos were color-printed and laminated. Photos used as probes were not used as intervention materials. The student clinicians elicited the personal narratives using three different prompts: 1) three of the child’s own photos; 2) three generic photos; and 3) an open-ended prompt “*What did you do in the weekend?*” or “*What did you do at school today?*”? Only neutral, open-ended verbal, or nonverbal prompts were used to encourage the children to continue their narrative, as per previous research (van Bysterveldt et al., 2012). The children’s responses were video recorded and transcribed by the student clinicians immediately following the session and coded for inclusion of the following personal narrative elements: Who, Where, When, What Happened, Action 1, Action 2, Action 3, Ending, Feeling. The maximum score was 9. In line with previous research, we chose to focus on the child’s *best* performance (e.g. McCabe and Rollins, 1994). This accounted for the possibility that a child could not remember an event and/or had not experienced an event which could have resulted in a score of 0, even though the child was capable of producing personal narratives in response to more meaningful prompts.

These assessment probes were administered and scored as follows:

Baseline phase: All three probes were administered three times, with the last assessment probes elicited at the beginning of intervention session 1. The child's best performance on these probes was used to determine baseline performance.

Intervention phase: The open-ended prompts were used at the start of each intervention session (intervention sessions 2 – 13). The child's best performance each week was used to track progress. The child prompts and the generic prompts were used once a week, at the start of the first session of the week (weeks 2 to 7), and the child's best performance was used to track progress.

Maintenance phase: The probes were re-administered on three separate occasions immediately after the intervention was completed. The same process was used as during the baseline phase.

Inter-observer Agreement

A second rater, a certified practising speech pathologist with experience in narrative data analysis, independently scored 87 randomly selected personal narrative transcripts for inclusion of narrative elements (31.6%). A Krippendorff alpha coefficient (Krippendorff, 1980) was calculated to document agreement between the two raters. Krippendorff's alpha using ordinal scaling was .949 for the total number of narrative elements (total score), indicating good agreement across coders.

Intervention

The personal narrative intervention adhered to principles outlined in previous studies targeting oral narratives at macrostructure level (Westerveld and Gillon, 2008; Petersen, 2011) or personal narratives in children with disabilities (Petersen et al., 2014; Finestack et al., 2017). These included: a) systematic introduction of the personal narrative elements (who, where, when, what happened, actions, and feelings); b) focus on meta-narrative awareness; c) using graphic organizers and visual supports, including laminated narrative elements cards (with the written words), generic photos, and the child's own photos; d) extensive use of modelling and scaffolding; and e) ample

opportunity for repeated practice. The intervention was implemented over seven weeks, in which the personal narrative elements were systematically introduced (Appendix A). All sessions were implemented by two student clinicians; each participant with Down syndrome attended one session by him/herself (session 1 of each week), and one session with a peer (session 2 of each week), who was also a participant in the study. We included a peer in one of the sessions to promote social interaction and to encourage generalization to people beyond the interventionists. New concepts were introduced during session 1 each week; session 2 was a repeat of the content introduced in session 1, but the participants took turns and were encouraged to share their personal narratives with their peer. The full manual, including the intervention materials, is available for download from www.marleenwesterveld.com.

Intervention Fidelity

The intervention sessions were carefully scripted in a manual, with step-up and step-down suggestions provided when needed to ensure the intervention matched the participants' language ability. Prior to the intervention, all students attended a half day training session conducted by the authors, in which the intervention was explained, the activities were modelled, and the student clinicians participated in role play. During the intervention sessions, the student clinicians used the manual to guide their sessions. All intervention sessions were video-recorded. All sessions were either observed live or viewed afterwards by the supervisors. Debriefing with student clinicians took place after each session as part of routine student supervision practices. Weekly whole group sessions were held to review participant progress and to discuss the following week's intervention activities. Every session (either live or video-recording) was scored for fidelity, i.e. consistency of implementation of the intervention, by checking the session for content (i.e. activities) and materials (as per the manual). No violations to the content or use of materials were observed.

Parent Survey

Upon completion of the intervention, after the post-intervention sessions, parents were asked to complete a brief, anonymous, on-line survey. Questions covered parent satisfaction (on a scale of 1

to 5 from extremely dissatisfied to extremely satisfied) of the duration of the intervention, the length of the sessions, the location of the intervention, the interventionists (i.e. student clinicians), and the materials that were used. We also asked parents if the intervention had changed the way their child talked about past events (if so, how?); had changed the way parents discussed past events with their child (if so, how?); and if they wanted to leave any other comments.

Results

To calculate the effectiveness of the intervention in improving children's performance, we calculated the percent of nonoverlapping data (PND) for each child, which allowed for comparison with the results from Finestack et al. (2017). This effect size is calculated as the percentage of treatment and post-treatment phase data exceeding the highest performance in the baseline phase. Effect sizes of > 90% are interpreted as very effective; 70 – 89% represent moderate effectiveness; 50 – 69% are debatably effective; < 50% are considered not effective (Lenz, 2013).

For illustration purposes, Figure 1 graphically illustrates the performance of participant 7A on inclusion of the number of elements during the baseline, intervention, and post intervention sessions on the three different probes: a) child photos, b) generic photos, and c) open prompt. Results across all participants are reported in Table 2. As shown in Table 2, on the open prompt, the intervention yielded moderate to effective results for five of the eight participants: 3G, 4F, 5E, 7A, and 8C and a debatably effective result for participant 1B. In response to the child's own photo prompts, only participant 4F showed a moderate improvement, with participant 5E showing a debatable improvement. None of the participants demonstrated an improvement on the generic prompts, except for participant 8C who showed a debatable improvement (57%). Finally, two participants (2H and 6D) showed no significant improvement in their inclusion of personal narrative elements following the intervention.

Table 2 *Participants' performance on inclusion of number of narrative elements on baseline, intervention, and post intervention probes.*

No	Prompt	B1	B2	B3	I1-S2	I2	I3	I4	I5	I6	I7	P1	P2	P3	No. Tx sessions	Effect Size
1B	Open	3	0	2	3	3	5	0	4	4	4	0	A	A	12	50%
	Generic	2	3	1		1	3	2	2	2	A	2	A	A		0
	Child	3	2	3		3	4	4	3	2	A	4	A	A		33%
2H	Open	0	5	3	2	5	4	3	2	0	4	5	3	2	10	0%
	Generic	0	3	4		3	1	4	2	5	2	0	5	7		22%
	Child	2	3	5		2	3	2	5	6	7	6	5	8		44%
3G	Open	0	0	0	0	4	1	1	5	4	7	5	0	A	13	78%
	Generic	2	2	2		1	2	2	2	3	0	3	0	A		25%
	Child	3	2	2		1	1	1	2	2	2	2	3	A		0%
4F	Open	5	4	3	3	4	6	7	7	6	7	7	6	6	10	80%
	Generic	4	5	6		3	6	6	A	3	A	7	4	6		14%
	Child	3	4	5		6	4	7	A	6	A	6	6	5		71%
5E	Open	1	0	0	1	4	5	0*	6	6	8	6	6	6	12	80%
	Generic	3	3	3		2	2	0*	3	0	3	4	0	2		11%
	Child	3	4	3		1	0	0*	6	6	6	5	5	4		67%
6D	Open	7	7	5	4	5	8	7	6	6	7	6	7	6	12	10%
	Generic	5	6	2		3	3	5	7	4	4	6	4	5		11%
	Child	6	6	6		7	5	3	5	5	4	4	5	6		11%
7A	Open	2	3	6	7	7	7	8	8	7	8	8	7	7	14	100%
	Generic	3	3	5		3	1	5	7	5	4	5	4	6		22%

	Child	6	4	7		6	4	6	4	7	7	7	6	6		0%
8C	Open	0	0	1	3	6	3	0	5	7	9	5	5	8	10	90%
	Generic	4	4	0		A	2	7	A	0	0	7	6	8		57%
	Child	4	6	5		A	6	5	A	4	5	5	8	8		29%

*A = absent; Effect sizes expressed in percent non-overlapping data: > 90: very effective treatments; 70 – 89: moderate effectiveness; 50 – 69: debatably effective; < 50: not effective. An effect size of 50% indicates that 90% of the data points in the treatment or post-treatment phase were higher than the highest / best data point in the baseline phase. E.g. participant 1B (open prompt): four of the eight data points in the intervention and post-intervention phases (I3, I5, I6, I7) were better than the highest baseline performance (B1). * session ended early as child was unwell.*

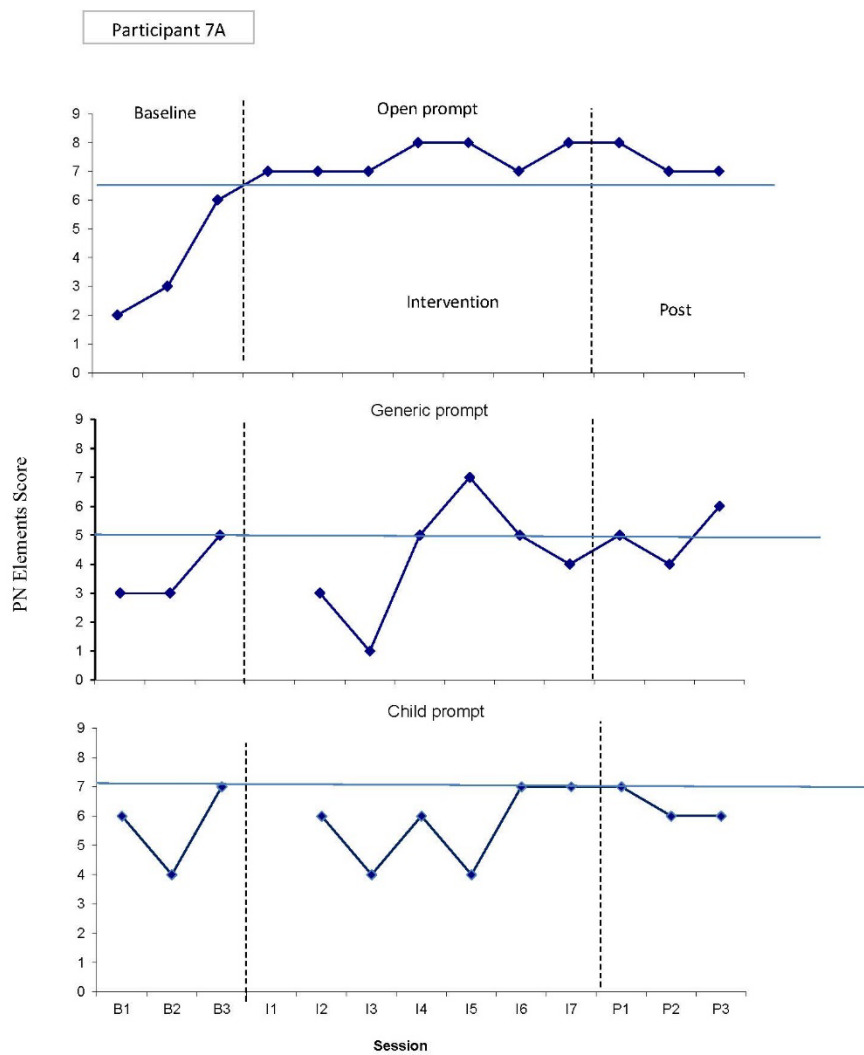


Figure 1. Participant 7A's performance on the Baseline, Intervention, and Post-intervention probes



Seven of the eight parents completed the post-intervention survey. When asked, four parents indicated they were satisfied or highly satisfied with the duration of the intervention, three were unsure, with two parents commenting the intervention should have been longer and one parent indicating it was quite intensive. All parents were satisfied with the length of the sessions, and were happy to bring their child to the university clinic. When asked if the intervention had changed the way their child

talked about past events, three parents said ‘a little’, one parent said ‘yes’, and three parents said ‘no’, with one parent commenting their child mainly talked about the future. Overall, five parents commented they had loved being part of it; enjoyed the whole process; were pleased with the high standard of the students [student clinicians]. One parent felt it was beyond her child’s level of ability, particularly when using ‘random’ pictures.

Discussion

This study investigated the effectiveness of a 7-week personal narrative intervention for eight school-aged children with Down syndrome, implemented by student clinicians. Although all participants showed an upward trend in the number of elements they included in their personal narratives in response to three different types of prompts, our results were mixed, with moderate to effective results for five participants, no improvement observed in two participants (2H, 6D), with participant 1B only showing a debatable improvement in response to the open-ended prompt. These results add to the limited literature on language interventions for children with Down syndrome (Smith et al. 2020). Our results seem more promising than Finestack et al.’s (2017) results, who found ‘debatably effective’ improvements on one personal narrative aspect (either MLU, inclusion of elements, or percent narrative utterances) for three of their four participants (aged 10 – 15 years) with Down syndrome, which may be linked to differences in intervention method, with our focus on macrostructure only as opposed to a combination of grammar and macrostructure goals. We now consider potential reasons for the participants’ varying degrees of responsiveness to the intervention, and provide suggestions for intervention and future research.

Five of the eight participants demonstrated significant improvement in their ability to include personal narrative elements in response to an open-ended prompt. These results are promising as open-ended questions such as ‘*What did you do in the weekend?*’ are frequently used in everyday situations. It should be noted that the open-ended prompts allowed the participants to select their own topic and many children repeatedly chose their favourite topic, such as going to the park or going to a birthday party, which may or may not have been referring to a recent outing. However, it allowed for

repeated practice which may well explain the slow but steady improvement in inclusion of elements over the duration of the intervention.

Of the three participants who made debatable or no significant improvement following the intervention (1B, 2H, 6D), participants 1B and 2H performed the lowest in receptive vocabulary (PPVT) at baseline, with age-equivalents of 2 years 6 months. MLU in words was 1.44 and 1.95 respectively, and percent intelligible utterances was low at 40.5 and 54.7. Previous research investigating the links between MLU and narrative macrostructure (in fictional narratives) showed the importance of MLU for producing higher quality narratives (Channell et al., 2015). Although in retrospect our exclusionary criteria could have been stricter to ensure that children had sufficient language skills to benefit from the intervention, participant 3G (baseline MLU of 1.0) made significant improvement on the open prompts following the intervention. Another consideration is if our intervention should have targeted intelligibility first for these two participants, perhaps within a personal narrative context (Yoder et al. 2016). Participant 1B's speech in particular was very difficult to understand, which may have limited opportunity for scaffolding. A final consideration is whether the intervention should have contained an explicit focus on vocabulary and syntax for these two participants, with previous research revealing more significant gains in MLU when targeting grammar in isolation (Sepúlveda et al., 2013), as opposed to embedded in a personal narrative intervention (Finestack et al., 2017).

Only two participants included more elements in response to their own photo prompts following the intervention and none of the participants included more elements in response to the generic prompts. Based on our previous research we did not expect a difference in responses between the generic and child prompts (van Bysterveldt and Westerveld, 2017). However, throughout the intervention we noticed some of the participants demonstrated difficulties in *creating* personal stories around the generic photo prompts. For example, the children had difficulty 'naming' the children in the photos, hypothesizing what could have happened prior to the time the photo was taken, and predicting what might happen next. These difficulties may relate to the children's inability to decontextualize their language, with participants who demonstrated higher levels of cognition

generally including more elements. However, this tentative conclusion will need to be confirmed in future research with a larger number of participants.

Limitations

This study was part of a student clinical placement with the intervention sessions conducted in the university clinic, while parents observed through a one-way mirror. Parents were not provided with any homework activities, nor did we involve the teachers' aides or the teachers who engaged with these children on a daily basis. Feedback from the parents generally indicated they were satisfied with the intervention, but had not changed the way their child talked about past events. Future studies should not only consider a more inclusive way of delivering the intervention, perhaps in small groups in the classroom, but also seek to more actively involve the parents, to encourage repeated practice with diverse conversational partners and promote generalization. Our coding system awarded points for inclusion of past event actions (maximum three points). It is possible that not all personal events contained three actions, which may have affected the child's performance. Future research may re-evaluate how to best score children's inclusion of elements. The inclusion of a relatively young participant group, with varying levels of cognition and expressive language skills emphasizes the contention between determining feasible structural language goals, while meeting expectations of the school curriculum and classroom experiences which are predicated on the children's chronological age. Coupled with the expected need for ongoing speech therapy intervention for this population, it is vital that we continue to seek inclusive, creative, and socially valid interventions in which therapeutic relationships are positive and engagement and participation is high. Finally, we included a peer (a fellow participant with Down syndrome) once a week to promote social interaction and encourage generalization to people beyond the student clinicians. However, we did not systematically evaluate the effectiveness of this strategy, so cannot comment on the impact this may have had on the participants' performance. Future intervention studies may also investigate including classroom peers (without Down syndrome) as a strategy for encouraging social interactions between the children with Down syndrome and their peers (e.g. see Dolva et al., 2011).

Future Directions

We used different types of photo prompts during the intervention, including the children's own photos and a bank of generic photos depicting children engaged in everyday activities. Positive therapeutic relationships developed between student clinicians and participants and engagement and participation was generally high. From week 6, we introduced a craft activity in response to some of the participants losing interest in the photos (e.g. by not responding and/or physically withdrawing from the activity) and others demonstrating difficulty generating personal event narratives in response to the generic photos. The photos taken during the craft activity were then used to encourage the participants to generate narrative elements, which worked well for those children whose cognitive ability may have hampered their engagement with the generic photo prompts. We agree with Finestack et al. (2017) that clinicians and researchers should carefully consider the types of visual supports that are provided during the intervention, and that personal photos captured on personal devices may be particularly motivating.

The results from this study highlight the importance of individualizing the interventions to best suit each participant's level of ability. Participant 6D included at least 6 out of the 9 narrative elements at the start of the intervention, so there was little room for improvement in response to the intervention. This participant might have benefited from targeting more advanced goals at microstructure level and/or ensuring her personal narratives covered a range of experiences. As suggested earlier, intervention for participants 1B and 2H could have focused on speech sound production first, and/or could have contained a more explicit focus on vocabulary and syntax before targeting personal narratives at macrostructure level. Even though the personal narrative intervention program was well received by both the parents and the participants, we urge clinicians to avoid the routine use of a completely manualized approach and base their intervention activities on both the pre-assessment results and the family's goals and aspirations (van Bysterveldt et al., 2019).

In conclusion, our findings indicated that most of the participants showed an improvement in their ability to include narrative elements in response to open prompts and personal photo prompts in

response to the intervention. Considering the importance of personal narrative competence in supporting social interactions and social and psychological wellbeing, we strongly encourage both clinicians and researchers to address personal narratives in children with Down syndrome to help promote true inclusion.

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Appendix A - Summary Overview of the Intervention

Week	Focus
1	Introduction of the story map. The emphasis is on the elements Who and Where.
2	The emphasis is on When and What Happened.
3	The emphasis is on Actions. There can be multiple actions in one story ('first' and 'then').
4	The emphasis is on End/ing.
5	The emphasis is on Feelings.
6	The child is asked to tell complete personal narratives with all the narrative elements, using the story map.
7	The child is asked to tell complete personal narratives with all the narrative elements using the story map.

Appendix B – Lesson Plan Week 2, Session 3

SESSION 3:

Goal A: Review the story grammar map and the narrative elements introduced in week 1.

Resources: Story map and counters; Photo B (Snakes and ladders)

Activity I: Model the narrative elements using the snakes and ladders photo, placing counters on the story map as you say each element.

Narrative element:	Example script:
When	On Saturday
Who	Mum and Jake
What happened	Played snakes and ladders
Past tense action	They played for an hour
Ending	Mum won!
Feelings	They enjoyed it

Goal B: Introduce and teach the concepts When and What happened

Resources: Story map and counters; narrative element cards; selection of 30 photos; game

Activity II: Show the child the two laminated cards (When and What happened). Read the words and provide a simple definition of these words.

When: Explain that When relates to the time their story happened. Examples of When: On Saturday; after school; in the holidays; yesterday; on Friday; in the weekend.

What happened: Explain that What happened relates to the setting and what you were doing in the story. Examples of What happened include: Playing, swimming, visiting, driving, running.

Activity III:

- a) Go through half of the photos and ask the child to come up with When and What happened for each of the photos. Repeat the child's answers with the correct speech model (aim for at least four recasts per minute). If the answer they provide is non-specific (e.g. *the other day*), provide a specific word (e.g. *the other day was Wednesday*). For children with more advanced language skills, repeat their short phrases and add a word.
- b) Go through the other half of the photos and this time prompt the child to come up with When and What happened by pointing to the laminated element cards. If the answer is a single word but relates to Who or Where repeat the child's response, then point to the correct element heading. For example:

Child	Girl
Clinician	Yes, it is a girl (point to Who) The girl is swimming (point to What Happened)

- c) If the child responds with either When or What Happened, expand on their responses with When or What Happened and point to the element cards. For example:

Child A	Swimming
Clinician	Swimming (point to What Happened) on Saturday (point to When)
Child B	Night-time
Clinician	You had dinner (point to What Happened) at night-time (point to When)

- d) For children with more advanced language skills, repeat their short phrases and add a word.

If it helps motivate the child, you may play a game alongside this activity.

Goal C: The child will come up with the narrative elements: Who Where When and What happened.

Step down: The child will be able to come up with the narrative elements Who and What Happened.

Resources: narrative element cards, counters, photos, game

Activity IV:

- a) Place the story grammar element cards for Who Where When and What happened on the table. Go through some of the photos with the child again. This time, ask the child to come up with Who Where When and What happened. Place a counter on the elements as the child says them so the child knows which one is missing. For example:

Child	Me and mum (place a counter on Who) On holidays (place a counter on When) To Paris (place a counter on Where) Sightseeing! (place a counter on What happened)
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Note that you may need to prompt or provide an answer. Remember to repeat the child's utterances e.g. "yes, you and mum were on holidays in Paris and were sightseeing!" If it helps to motivate the child, you may play a game alongside this activity.

- b) Using a video recording device, film yourself modelling a personal narrative. Make sure this personal narrative is different to last week's personal narrative. Examples of personal narratives can be found in Appendix X of the manual or you may use the template below:

Let's talk about the weekend!

Narrative element:	Example script:
Who/What happened:	On xx I went to xxx with x and x
Past tense events:	We x and we x
Ending:	xx
Feeling:	We had so much fun OR it was tiring/ exhausting

c) Ask the child to film a personal narrative by using the prompt “*did you do anything nice or interesting over the last few days?*” After the child has completed telling their personal narrative, review both of the personal narratives by watching them back on the video recording device. Play the clinician’s model narrative back first. Ask the child to determine if there was evidence of Who, Where When and What Happened in the recorded personal narrative by placing counters on the story grammar map when they hear an element being used. Pause the video if necessary and provide feedback. Repeat this activity with the child’s recorded personal narrative.

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