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The Role of Interactive Practice in Children's Language Development

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This study developed, delivered and evaluated an interactive intervention, which targeted three- and four-year-old children's oral language. The intervention was carried out over twice-weekly sessions, for ten weeks. The first weekly session was a group shared storybook reading session with a puppet and the second weekly session consisted of planning, acting out and reviewing a planned pretend play episode based on the storybook, which was read in that week's first session.

Ninety-four children were randomly assigned to a control or treatment group and were tested at pre- and post-test on a battery of vocabulary and narrative assessments. The results of a Randomised Controlled Trial showed a statistically significant effect on the receptive vocabulary and productive vocabulary of the children in the treatment group, with medium to large effect sizes. A further positive effect concerned the *Mean Length of Utterance* (MLU) of the children in the treatment group.

Keywords: oral language; narrative development; storybook reading; pretend play; intervention; early years; role of the adult

Introduction

The role of the adult in children's language development has been much debated (Field 2010; Baumer, Ferholt, and Lecusay 2005; Einarsdóttir 1998; Siraj-Blatchford and Manni 2008; Sénéchal 1997b; Lillard et al. 2013; Bannard, Klinger, and Tomasello 2013; Carpenter, Uebel, and Tomasello 2013; Sheil et al. 2012; Wood 2010; Whitebread 2012). A recent European Union report, *Key Data on Early Childhood Education and Care* (2014) has advocated a mix of adult-led and child-initiated activities in the Early Years. The Report found that there was a balance between these two types of activities in the UK; however, there was little support material for practitioners on how this should manifest itself on a daily basis in settings (European Commission/EACEA/Eurydice/Eurostat 2014). Many adults in the Early Years in the

UK see their role as being increasingly one of an assessor who completes profiles and developmental paperwork (Baldock, Fitzgerald, and Kay 2013; Allen 2011; DfE 2012; Roberts-Holmes and Bradbury 2017). This can lead to practitioners being confused as to what their pedagogical role actually is. This study supports an active role for the practitioner in children's language development and provides some evidence of the benefits of adults engaging in children's pretend play.

Learning Language – An Interactive experience

Interactionist language development perspectives argued that the child's learning occurs in conjunction with a more experienced peer/adult (Bruner, 1981; Vygotsky, 1986). Bruner claimed that one of the more important aspects of this interaction, which facilitates language development, is the growth of reference, or the management of joint attention (Bruner, 1983). For example, the joint attention, which is required during a group shared storybook session, has been successful in improving children's literacy outcomes, through the promotion of richer conversational exchanges (Beck & McKeown, 2007; Bierman *et al.*, 2008; Coyne, Simmons, Kame'enui, & Stoolmiller, 2004; Fricke *et al.*, 2013; Haley *et al.*, 2017; Langenberg *et al.*, 2000). Dialogic discussion with an adult and their peers during storybook reading, and the use of books with repeated rhymes and phrases, can develop children's vocabulary (Mol, Bus, & de Jong, 2009; Silverman & Hines, 2009; Whitehead, 2002). Haley and colleagues (2017) found effects for taught vocabulary with their preschool storybook reading intervention (Cohen's $d=1.04$) but not for the standardised vocabulary measures (Haley *et al.* 2017). The benefits of such interventions on standardised vocabulary are as yet inconclusive, therefore more research is needed.

Harris and colleagues (2011) argue for the use of a mixture of pedagogies used to teach vocabulary to children, for example storybook reading *alongside* explicit

instruction or, in the case of the current study, pretend play episodes (Harris, Golinkoff, & Hirsh-Pasek, 2011). Results from previous studies which combine storybook reading with pretend play showed promise (Conner et al. 2014). However, research which has been conducted on pretend play over the last two decades has varied in terms of its methodological strength, so there is a need for more experimental research in the area.

Lillard and colleagues, in their meta-analysis on play in 2013, concluded that, due to various methodological problems associated with the studies which have been conducted thus far, pretend play is more of an epiphenomenon which works well alongside adult involvement, rather than having any causal effect on development in its own right (Lillard et al. 2013). However, they do maintain that the evidence shows that pretend play can aid memory and thus support story retelling, even if these effects can be limited. Language and story retelling, they claim, have a relationship due to the similar symbolic functions which they both have. Lillard and colleagues' study called for more methodologically-sound empirical research on pretend play and its potential causal relationship with language development.

Weisberg and colleagues (2013) responded to the Lillard study, criticising it for almost completely disregarding a body of studies on pretend play due to flaws in their methodologies. They also criticised the authors for taking too narrow a definition of pretend play as only a child-initiated activity (Weisberg, Hirsh-Pasek, and Golinkoff 2013). They suggest that perhaps pretend play should not only be child-directed or adult-directed, rather it should be a blending of the two. This would echo what Sameroff (2009) argues about children's development, that it is a *transaction*, rather than solely an *interaction*, where one party (usually the child) is changed by the actions of the other. He claims it is a bidirectional relationship, where both the environment and the child have influence on each other. In discussing how children acquire language,

Sameroff argued that children learn, adapt, and adopt language as they grow, and they cease to learn language when the people who surround them in their environment have ceased producing novel situations which stretch their capabilities (Sameroff 2009).

Therefore, the role of the adult in play, and in turn, children's language development, is crucial.

The Role of the Adult

The adult's role is viewed in the current study as one of an enabler, providing an environment where language development can take place. Enabling environments are very much promoted and encouraged under the current Early Years Foundation Stage framework, which practitioners follow in the early years in England (Department for Education, 2012; Evangelou, Sylva, Wild, Glenny, & Kyriacou, 2010; Moylett & Stewart, 2012).

The scaffolding of the child during these transactions in play can be aided by the adult entering the play as a character, or as Heathcote (1980) termed it for drama in education: *in role* (Anderson, 2012; Baldwin & Fleming, 2003; Dickinson & Neelands, 2006; Heathcote, 1980). Within this role, adults can be flexible. Their position is one of evoking, not directing, the play. They can extend children's language by engaging with them in role, by introducing new vocabulary to them and by modelling the pragmatics of language (Baldwin and Fleming 2003). Practitioners have a difficult task in seeking to strike a balance between trying to control the play and helping (the) children achieve the objectives for the lesson, while still protecting and valuing each child's contribution (Dickinson & Neelands, 2006).

There can be tension too, between the pedagogical frameworks surrounding play on the one hand, and policies to which practitioners must adhere on the other. This results in recommendations for practitioners which are ambiguous (Wood 2010). As a

result, work-play dichotomies exist, which can result in children being left to play in non-interactive ways with adults, and play being viewed as something that children do when they are not learning. Furthermore, when adults approach children's play, they can receive an unwelcoming reaction from young children, as they are not always used to playing alongside adults. This can result in apprehension on the part of the adults, and, in turn, a reluctance to interfere in children's play.

The evidence discussed so far suggests that interaction with the adult can have positive effects on young children's language development. However, this evidence is, as yet, inconclusive. Therefore, there was a need for the trial of an intervention which incorporates oral language methodologies that are appropriate for young children (play and activity-based learning), that can support children's oral language development and, thirdly, inform practice into the future (Bond & Wasik 2009; Howes *et al.* 2008; Nutbrown, 2012).

The Current Study

This study had two main aims:

1. To deliver a specially developed and workable intervention, *Let's Talk*, which supported young children's oral language development in the areas of narrative (story-retelling) and vocabulary development in a ten-week school term in Early Years settings.
2. To examine the intervention's efficacy by conducting an RCT.

Method

Participants

The sample consisted of 94 children, 37 males and 57 females. Their ages ranged from

37 months to 55 months. There were 16 males and 36 females in the treatment group, and 21 males and 21 females in the control group. Local Authority nurseries, private nurseries and voluntary childcare services in Oxfordshire Local Authority's jurisdiction were the main focus of the recruitment process. English was predominantly the first language of the children (84.6%). The majority of children had one sibling (50%), came from homes with married parents (52%), lived in rented accommodation (65.4%) and identified as White British (61.5%). The children were from a mix of socio-economic groups, (low=37%, middle=32.9% and high=30.1%).

Ethical clearance was obtained from the University of Oxford Central University Research Ethics Committee (CUREC) and followed guidelines from the British Educational Research Association. Information leaflets were provided to the settings and parents. Each child for whom informed parental consent was received was randomly allocated to either the treatment or control group using a random number generator (www.random.org). The treatment group was filled first, as the Pilot Study showed that the random number generator indicated an independence of observations. Each child's assent was sought before each assessment and before the commencement of his/her group time.

The Treatment

Let's Talk

The intervention (*Let's Talk*) took place twice weekly for ten weeks, groups of three to five children. It featured a two-pronged approach – firstly, a group-shared storybook reading session, with a puppet, and a dialogic discussion, followed by a planned pretend play session later in the week when the children also practised retelling the story using the visual prompts. Each session was based on thematic units appropriate to the

children's environment, interests and the *Early Years Foundation Stage* learning goals (Department for Education, 2012, Gmitrova, Podhajecká & Gmitrov, 2009).

The Control Group Sessions

The control groups also consisted of three to five children. Children in the control groups completed age-appropriate early numeracy activities and games. The number, timing and duration of control-group sessions mirrored the sessions the treatment groups received, to reduce Hawthorne effects (Gomm 2008).

Fidelity

Each intervention and control group session began in the same way, with the researcher leading an informal chat with the children. The puppet was introduced in the intervention session in the same way each week and the same language was used to introduce the book and frame the sessions. All sessions were audio-recorded, to ensure comparability between settings. The intervention was documented with a comprehensive manual and resource pack for each week to allow for replicability of methods and implementation. The same configuration of furniture and the relative positions of the children and researcher were followed in all settings for the storybook and discussion sessions.

Measures

Child Specific Measures

Children were tested at pre- and post-test on a battery of standardised vocabulary (receptive and productive) and narrative assessments. For productive vocabulary outcomes, The *Naming Vocabulary* sub-test from *the British Ability Scales* (Elliott,

Smith, and McCulloch 1996) was used. Secondly, a naming vocabulary test was designed to assess the productive vocabulary, and whether the words were taught effectively over the course of the intervention. This is referred to in this article as the *Researcher Designed Vocabulary Test*. *The British Picture Vocabulary Scales II* (Dunn et al. 1997) was used to test the children's receptive vocabulary.

In testing the narrative outcomes of the children, *The Bus Story Test* (Renfrew 2001) was used. A second narrative assessment, the *Test of Narrative Retell* (TNR) was also used (Spencer & Petersen, 2010). Two non-verbal measures were used to act as control measures, the *Block Building* and *Picture Similarities* sub-tests of the *British Ability Scales*.

It was necessary to ensure that the child's Working Memory was not influencing his/her narrative retell ability. However, Working Memory assessments are often not appropriate for children of three to four years old (Montgomery, Polunenko, and Marinellie 2009). As Executive Function is highly correlated with Working Memory, and many of these are suitable for young children, an Executive Function task was chosen instead, namely *The Dimensional Change Card Sort* (Zelazo et al., 2003; Zelazo, 2006).|

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The assessments are standardised, with the exception of the TNR narrative assessment, and the *Researcher Designed Vocabulary Test*. The instruments were directly related to the outcomes of the intervention, had adequate fitness for purpose and were reliable, which all led to internal validity (May 2001; Stobart 2009). The tests were administered in a uniform way at pre- and post-test.

Family Background

A self-administered questionnaire was also developed for parents, to obtain information on the demographics of the sample. The return rate for the questionnaires was high at

83% (n=78).

Results

Analytical Strategy

This was an experimental research design. Pre- and post-test data was collected and outcome scores were examined while controlling for pre-test scores. To investigate the effect of the intervention on the oral language skills of the children in the treatment group, an Analysis of Covariance (ANCOVA) was used. In order to ensure balance in the covariate of pre-test scores, the pre-test scores were compared. Results showed that there was no statistically significant difference between the treatment and control groups at baseline, suggesting that the randomisation within each setting was successful (Table 1).

Insert Table 1 here

Narrative Ability

Children's narrative ability, namely their *Mean Length of Utterance* (MLU), was better at post-test in the treatment group than in the control group, while controlling for pre-test scores, with a medium effect size¹. The statistically significant difference in the children's MLU on *Bus Story Test* was evident in the mean scores, with the treatment group scoring more (7.00 points) than the control group (5.89 points); $F(1, 89) = 4.04$, $p < .05$, and with a medium effect size of partial $\eta^2 = .04$.

¹ Effect sizes measured as partial eta squared; 0-.04 – small to medium, .04-.06 medium to large & .06-1.0+ large (Cohen, 1988)

However, the treatment group children's grasp of story grammar, as measured by the *Test of Narrative Retell* (TNR) and *Bus Story Information* score was not statistically significantly different from the control group's at post-test. Results showed that there was no effect of the intervention on the *Bus Story Information* score when the pre-test scores were controlled for; $F(1, 89) = 2.27, p = .14, \text{partial } \eta^2 = .03$ (Table 2). When the pre-test scores were controlled for in *Test of Narrative Retell*, there was also no significant effect of the intervention $F(1, 88) = 2.98, p = .09, \text{partial } \eta^2 = .03$ (Table 2).

The adjusted mean scores (Table 2) show that the treatment group had higher scores on all three narrative measures at post-test, with MLU being statistically significant.

Insert Table 2 here

Executive Function

The scores from the *Dimension Change Card Sort* task were controlled for, to establish whether Executive Function could explain any of the variance on the narrative tests.

There was only a correlation between *Test of Narrative Retell* and *Bus Story Information* score and the Executive Function task, so these were included in the model (Montgomery, Polunenko, and Marinellie 2009). When an ANCOVA was carried out on the *Bus Story Information* score, controlling for Executive Function and pre-test scores, there was no effect of the intervention; $F(1, 88) = 2.04, p = .16, \text{partial } \eta^2 < .01$. There was also no effect of the intervention when Executive Function was controlled for on the *Test of Narrative Retell*, $F(1, 88) = .276, p = .10, \text{partial } \eta^2 = .03$.

Controlling for random differences in Executive Function at pre-test meant that there was no effect of the intervention on the children's narrative ability (Tables 3 & 4). As there was no statistically significant relationship between Executive function and

group, we can assume that randomisation was successful and that Executive Function could not predict narrative outcomes.

Insert Tables 3 &4 here

Receptive Vocabulary

Mean scores show a positive effect of the intervention in receptive vocabulary, with the treatment group having a mean score of 93.53 points and the control group scoring 89.53 points; $F(1, 89) = 5.90, p < .05$, with a large effect size of partial $\eta^2 = .06$. There was also a significant relationship between the covariate and *British Picture Vocabulary Scales* (BPVS) (Table 5). When the BPVS pre-test score was controlled for, there was a significant effect of the intervention on the post-test scores of the children.

Productive Vocabulary

There was a statistically significant difference between the groups when the pre-test score of the *Researcher Designed Vocabulary Test* was controlled for; $F(1, 89) = 7.04, p < .05$, with a large effect size of partial $\eta^2 = .07$ (Table 5).

However, there was no significant effect of the intervention on *Naming Vocabulary* while controlling for pre-test scores; $F(1, 90) = .88, p = .35$, partial $\eta^2 = .01$.

Therefore, there was an effect of the intervention on receptive vocabulary and on productive vocabulary, as reported by the *Researcher-Designed Vocabulary Test*. This strengthens the case that the teaching of the target vocabulary was effective in the intervention. As there was a strong positive correlation between the standardised receptive and productive vocabulary measures in this study, $r = .57, p < .0005$ (one-tailed), it can be argued that the intervention had a large positive effect on the vocabulary of the children in the treatment group.

Insert Table 5 here

Gender

There was a large effect of the intervention on *Researcher Designed Vocabulary Test* (RDVT) when the gender of the children was added as a fixed factor and pre-test scores were controlled for; $F(1, 87) = 5.50, p < .05$, partial $\eta^2 = .06$. There was no interaction effect of gender and the group, $F(1, 87) = .15, p = .70$. The randomisation was successful at pre-test, as the outcomes did not vary across gender at post-test.

Discussion

Young children in the UK increasingly move from preschool to primary school with insufficient oral language skills (Bercow, 2008; Lindsay *et al.*, 2010). Although narrative and vocabulary development can increase exponentially between the ages of three and five years (Bowyer-Crane *et al.* 2008; Fricke *et al.* 2013), this is not reflected in the support and/or materials available for practitioners to draw upon during this developmental period (European Commission/EACEA/Eurydice/Eurostat 2014).

Against this background, there is clearly a need for a body of *experimental* research, testing the efficacy of interventions incorporating age-appropriate oral language strategies in which adults can support children's oral language development in the Early Years (Bond and Wasik 2009; Howes *et al.* 2008; Nutbrown 2012; Haley *et al.* 2017).

The current study addressed this two-pronged need by developing and testing the efficacy of an interactive intervention which combined shared storybook reading and planned pretend play. The intervention was based on both social interactionist and transactional principles (Sameroff 2009; Vygotsky 1978). With these models as the foundation for its components, the intervention facilitated the child's interaction with peers, the intervention material itself, but also with the adult.

Vocabulary Development

The results in the current study support previous research findings that group shared storybook reading has beneficial effects on younger children's vocabulary development (Aram 2006; Biemiller and Boote 2006; Bowyer-Crane et al. 2008; Silverman and Hines 2009; Sénéchal 1997a; Whitehead 2002; Munro, Lee, and Baker 2008; Roskos and Burstein 2011; Zevenbergen, Whitehurst, and Zevenbergen 2003).

The findings in the current study also corroborate existing literature, which has suggested that shared reading with an adult combined with another medium of instruction, e.g. pretend play, can improve children's vocabulary (Harris *et al.*, 2011).

The storybook was used as a stimulus and the children used the plot and characters to underpin a pretend play episode. The short time lapse between the revision of the story in the pretend play session and the actual enactment of the play episode itself, afforded the children the opportunity to hold the target words in their working memory just long enough to be able to transfer them to the pretend play. In the play episode, these words were used and reinforced, thus enabling their transfer to the children's long-term memory (Samuelson 2002; Smith 2000).

The intervention aimed to support children's use of new vocabulary in play and conversation. Even with rich instruction, learning vocabulary is extremely difficult for young children (Elley 1989). This can explain why the results of standardised assessments do not always yield large effect sizes (Piasta and Wagner 2010). The use of researcher-designed vocabulary tests has been the subject of some debate in recent years, as it is often viewed as 'teaching to the test' (Coyne *et al.*, 2004; Beck & McKeown, 2007). However, in the case of the current study, as the target vocabulary was *contextually* based, i.e. it was taken from the storybooks used in the intervention, it was deemed appropriate to test the vocabulary which was being targeted, and indeed the

effectiveness of the teaching of it, alongside standardised norm-referenced vocabulary assessments. A statistically significant difference between the groups on the *Researcher Designed Vocabulary Test* (RDVT) was found. This significant result did not continue in the standardised test: *Naming Vocabulary*. On close examination of the mean values for the treatment and control groups, and as there was no significant difference between the groups at pre-test, it is reasonable to suggest that the treatment group's *Naming Vocabulary* mean scores were higher (51.14 points, *ns*) than the control group's (46.29 points, *ns*), though not statistically significant. Finally, as receptive and productive vocabulary were strongly positively correlated in this study, it is reasonable to suggest that the intervention had an effect on the vocabulary of the children in the treatment group.

Narrative Ability

The potential for the development of children's narrative ability is maximised between the ages of three and four years (Baldock 2006; Uccelli et al. 1999; McPherson 2002; Stadler and Ward 2005). While there is a large body of evidence which supports storybook reading as a means of supporting *vocabulary development* (discussed above), the empirical evidence to support storybook reading and pretend play as a means of supporting *narrative ability*, is lacking (Lillard et al. 2013).

Results in the current, experimental study show that the intervention had a positive effect on the *Mean Length of Utterance* of the children. The adult facilitated the elicitation of the narrative statements in each session, through the provision of visual prompts and the encouragement of retelling of elements of the story. The children also described their part of the story to the puppet and revised and recreated the sequence of events in the pretend play. The combination of both adult-elicitation and child-initiation during the sequencing part of the intervention and the pretend play sessions are likely to

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have helped the children to practise remembering and speaking about the stories which were read to them each week (Epstein and Phillips 2009).

Furthermore, when the adult was in-role, she scaffolded the children in developing their pretend play sessions. The researcher helped the children to execute the play session by playing alongside them, and encouraged discussion about their role each week during the review part of the play session. This supportive and facilitative stance of the researcher more than likely helped the children to practise and rehearse talk, which had a positive effect on their *Mean Length Utterance*. In addition, playing a role as another character in the pretend play provided the children with opportunities to express themselves more freely. The anonymity associated with playing such a role could have increased the children's willingness to talk. It would be interesting to investigate this further by way of a follow-up [study](#).

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The use of research-based play preferences of children to inform the themes of the intervention had a positive effect on the overall engagement of the children with the play episodes. The play sessions devised by the adult in each week of the intervention facilitated talk that was based on child-friendly themes, thus rendering the intervention a good fit with the children's current interests. This could also have improved the children's overall engagement with the pretend play sessions, once again increasing their propensity to utter more words (Gmitrova, Podhajecká, and Gmitrov 2009).

The results of this experimental study build upon studies such as Lillard and colleagues (2013), who highlighted the lack of experimental studies with robust methodologies. This study, although modest by comparison with some of the RCTs described by Lillard and colleagues, used an RCT and randomly assigned the sample to a treatment or control condition, thus answering the call for more Randomised Control Trials (RCTs), which examine interventions to support narrative development.

One should be cautious of linking only the pretend play directly to the narrative scores of the children, as the direct link between the two was not measured in the current study. However, it would be reasonable to suggest that the pretend play, combined with the storybook reading session, had an effect on the children's *Mean Length of Utterance*.

Conclusion

The intervention had a significant effect on the vocabulary of the children in the treatment group, with medium to large effect sizes. It also had a positive effect on the narrative skills (MLU) of the children in the treatment group when compared to the children in a control group, with medium to large effect sizes. The effect on narrative skills is significant for research purposes, as little experimental research has been conducted on MLU to date.

This intervention was designed with practitioners in mind. The aim was to develop a workable intervention which was inexpensive and easy to deliver, with minimal resources required. The intervention achieved this, as the resources can be changed, depending on what storybooks are available in the setting. It might require some extra training, but the intervention is such that it could be adapted to suit any setting, as long as there are willing practitioners available.

The intervention also has the potential to be used as a tool for the professional development of early years practitioners. For example, as the intervention is based on child development/language development theory, training on the components of this intervention could upskill practitioners with both practical skills and the knowledge which underpins it. The pairing of abstract knowledge with the experience they may possibly have already is beneficial to their professional development and ultimately their approach to delivering Early Years Education.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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Tables

Table 1 Independent Samples t-test for Pre-test Scores

Variable	t	Sig 2 tail	df	Group	Mean (SD)
Picture Similarities	-.13	.90	92	TG	47.06 (6.49)
				CG	47.24 (6.64)
Block Building	.66	.51	91	TG	40.4 (27.87)
				CG	41.3 (18.90)
Naming Vocabulary	1.41	.16	92	TG	47.12 (11.26)
				CG	43.62 (12.83)
Total t score	.39	.70	92	TG	175.58 (24.87)
				CG	173.50 (26.76)
General Conceptual Ability	.42	.67	92	TG	90.29 (11.75)
				CG	89.21 (12.76)
Researcher Designed Vocab Test	1.31	.19	91	TG	8.18 (2.41)
				CG	7.45 (2.92)
BPVS standardised score	.53	.60	91	TG	90.15 (12.53)
				CG	88.76 (12.74)
DCCS (Executive Function)	.93	.35	91	TG	17.17 (7.11)
				CG	15.61 (9.05)
Verbal Ability Cluster score	.30	.77	90	TG	89.84 (18.13)
				CG	88.83 (13.17)

Bus Story information	1.17	.24	91	TG	9.31 (5.49)
				CG	8.02 (4.89)
Bus MLU	1.19	.24	91	TG	5.75 (2.30)
				CG	5.18 (2.24)
TNR	.98	.33	90	TG	9.40 (4.55)
				CG	8.53 (3.84)

TG=Treatment Group, CG=Control Group

Table 2 Main Effects for all Narrative Measures Controlling for Pre-tests

Bus Story MLU Score				
Group	Adjusted Mean	Df	F	Partial η^2
Treatment	6.81	1, 89	4.04***	.05
Control	6.12			
Test of Narrative Retell				
Treatment	11.05	1, 88	2.98**	.03
Control	9.66			
Bus Story Information Score				
Treatment	12.06	1, 89	2.27**	.03
Control	10.59			

* $p < .005$, ** ns , *** $p < .05$

Table 3 ANCOVA for Bus Story Information Score with Executive Function as Covariate

Bus Story Information Score					
Group	Observed Mean	Adjusted Mean	SD	N	
Treatment	12.57	12.03	6.43	51	
Control	9.95	10.63	6.95	41	
Source	Sum of Squares	df	Mean Squares	F	Partial η^2
Pre-test	1950.10	1	1950.10	91.26*	.51
DCCS	25.33	1	25.33	1.19**	.01
Group	43.633	1	43.63	2.04**	.02
Error	1880.53	88	21.37		

* $p < .005$, ** ns , $R^2 = .55$ (Adjusted $R^2 = .53$)

Table 4 ANCOVA for TNR with Executive Function as Covariate

Test of Narrative Retell					
Group	Observed Mean	Adjusted Mean	SD	N	
Treatment	11.27	11.03	5.22	51	
Control	9.38	9.69	4.17	40	
Source	Sum of Squares	df	Mean Squares	F	Partial η^2
Pre-test	731.52	1	731.52	51.10*	.37
DCCS	19.03	1	19.03	1.33**	.02
Group	39.37	1	39.37	2.76**	.03
Error	1248.01	87	14.35		

* $p < .005$, ** ns , $R^2 = .41$ (Adjusted $R^2 = .39$)

Table 5 Main Effects for Vocabulary Measures Controlling for Pre-tests

Researcher-Designed Vocabulary Test				
Group	Adjusted Mean	Df	F	Partial η^2
Treatment	9.65	1, 89	7.04***	.07
Control	8.37			

British Picture Vocabulary Scales				
Treatment	93.53	1, 89	5.90***	.06
Control	89.53			
Naming Vocabulary				
Treatment	49.68	1, 90	.88**	.01
Control	48.06			

* $p < .005$, ** ns , *** $p < .05$