

INTERVENTION FOR CHILDREN WITH WORD-FINDING DIFFICULTY: IMPACT ON FLUENCY DURING SPONTANEOUS SPEECH FOR CHILDREN USING ENGLISH AS THEIR NATIVE OR AS AN ADDITIONAL LANGUAGE

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ABSTRACT

Types of intervention that could be targeted when there are high rates of word-finding difficulty were examined for any impact they had on speech fluency (whole-word repetition rate in particular). Results are reported that are interpreted as showing that a semantic-based intervention has an impact on fluency as well as word-finding.

Keywords: EAL, word-finding, stuttering, intervention

1. INTRODUCTION

A procedure has been developed that identifies reception-class children who are disfluent [6, 8], allowing schools to refer them for speech language therapy (SLT). About 40% of the children in the schools we work with speak English as an additional language (EAL) and thus often experience word-finding difficulty (WFD) on some content words. They respond to WFD by repeating function words or pausing prior to the content word that they cannot retrieve. This interrupts the forward flow of speech and gives them time to seek an alternative way to communicate their message. Our screening procedure excluded whole-word repetitions (WWRs) as signs of disfluency [11]. Therefore, EAL children who had high rates of WWR because of WFD were not considered disfluent. However, other authors count WWR as disfluencies [10]. The speech-based assessment was appropriate as it was validated against a non-word repetition (NWR) test designed so that it applied to the majority of languages spoken by the EAL children [7]. Children with disfluencies (EAL or English only, EO) performed worse on the NWR test than did fluent controls, but children with WFD (EAL or EO) performed similarly to fluent controls. Whilst the children with disfluencies are considerations for referral to SLTs, schools regard WFD to be an issue that they should address

themselves; improving vocabulary is an educational goal. A systematic review identified the types of intervention directed at EAL children, the majority of which involved literacy training (reading) in one form or another [9]. Based on the above observations, it would be expected that these interventions would also have an impact on fluency and reduce WWR rate in particular. This would also serve as a check as to whether children with disfluencies have been missed and classed as having WFD.

The literature on interventions used with patients with WFD, including that on WFD in second language learning, was examined to identify suitable possibilities for intervention. Semantic feature analysis (SFA) is one treatment used with aphasic patients. The semantic attributes of words are used as probes to activate semantic networks that encompass the target word to be retrieved [13]. SFA with aphasic patients leads to more accurate naming of words in isolation [1] and in discourse [1,2]. Circumlocution-Induced Naming (CIN) is another method. CIN trains patients to talk round target words when they experience retrieval difficulty [3]. CIN improves word retrieval of test and novel words [3, 9]. Circumlocution has been successfully used with adults learning a second language [12]. The effects of circumlocution training depend on participants' language proficiency insofar as advanced learners use this, as well as language-based strategies, to avoid WFD more often than do beginning language learners [12].

Here a group-based procedure was designed for use with 4-5 year old children in schools who had WFD (not EAL children alone). However, more EAL children than EO children have WFD. Details of EAL children's language history were obtained. The standardized test of WFD [4] and fluency assessments [6, 11] were made before and after the intervention, and one week after the intervention finished. Children were assigned to treatment or non-treatment interventions in mixed language groups.

2. METHOD

2.1. Participants

Children's speech had been assessed as part of the ongoing screening study [7]. This procedure involves assessment of %WWR and % fragmentary disfluencies in a sample of speech which is at least 200 syllables long. The children who were selected had rates of WWR in the top 10% but had below average disfluency counts. The selection was not based on language spoken nor gender, but 64% were EAL and 70% were male. Many languages were spoken (see [8]). Language history information was obtained from the children and verified by teachers. This included information where the child was born, language spoken at home and school etc. (space limitations preclude a full report). A protocol was used to score the questions, and these were used to match the EAL children for language level and to check EO children's status. Children's scores correlated well with parents' scores.

Sixteen children were selected for the study and were split into four groups of four. In each group of children, two were EO and two were EAL, and all were male. The two EAL children in each group spoke a different language (otherwise they may have used code-switching). Native language of the EAL groups was matched for two pairs of groups. Polish and Urdu were the languages in one pair and Akan African and Romanian in the other pair. One of these pairs of groups received the intervention and one received no intervention (see below).

2.2. Baseline performance

German's [4] Test of Word Finding in Discourse (TWFD) was used to measure WFD according to the instructions in the manual. The experimenter first conversed with the participants to put them at ease. A practice picture description task was given to children to familiarize them with the speech procedure. Participants then described a carnival scene. In this report only prevalence of word-finding characteristics (e.g. unnecessary repetition of words, empty words that add no content or specificity, speech delays etc.), are reported as indications of WFD.

A separate spontaneous speech sample was recorded and used to obtain %WWR [7]. Participants chose a topic and talked about it. Occasionally children did not speak long enough on the topic and the experimenter had to give short prompts. Each WWR was counted as one event irrespective of the number of times the word was repeated; this was expressed as the percentage of WWR out of all syllables reported. As a further check on fluency, fragmentary

disfluencies were assessed, as described in [11] and it was confirmed that rates for these children were low.

2.3. Intervention and no-intervention conditions

There were two components to the intervention. The first checked that the children knew the name of each picture by pointing at one of the four pictures on a card – one picture was of the target word and the other three were fillers. Stimuli were selected (based on a pilot study) as likely to be known, but difficult to name by children with WFD. The words were low frequency and there were 30 nouns and 30 verbs in total. This component was done once, at the time of the TWFD assessment.

The second component was a picture-naming game that started one week after the first component and continued for three sessions, with one-week intervals between each session. Pairs of children were tested, and the pairings of members in the groups was counterbalanced such that each child had one session with each other member of the group. The procedure was identical in all three sessions, except that each child was tested on different sets of stimuli each time, so by the end of three weeks they had been tested on all stimuli). Thirty-three percent (10 nouns and 10 verbs) of the stimuli were assigned as the stimuli for that participant for the particular session. Different stimuli were given to each member of a pair. One child was selected for test at random. The other child helped the experimenter by showing the test child the picture.

The experimenter asked: 'What is this object?' when a noun was presented, and 'What action is happening?' when a verb was presented. When stimuli were named correctly, the next test item was presented. Two semantic prompts were prepared in case the child failed to name the word. Examples of probes for nouns were 'Where would you see this?' and 'Who would use this?'. Examples for verbs would be 'Who would do this?' and 'Where would you see this?'. The test child was given an opportunity to respond after the first prompt. If they still could not name the object, they were given the second prompt. If the child still failed to name the object correctly, the first phone of the word was said by the experimenter and the child was given another opportunity to respond. If this last prompt did not help, they were told what the target word was. Scores for the amount of semantic and phonological help given ranged from 0 (no help), 2 (one semantic cue needed) 4 (two semantic cues needed) and 5 (two semantic cues and first phone). This scoring procedure weights semantic cues more than phonic cues. The roles of test child and helper were then reversed and the second child performed these tests.

The order of who was tested first was arranged so all children were tested first and second. At the end of the three training sessions, the fluency and TWFD assessments were repeated. A week later these same tests were run again to establish whether any intervention effects on WFD and WWR had been retained. The non-treatment group received the same procedure, but the probes were given to words that the child had responded to correctly.

3. RESULTS¹

Raw scores for word-finding behaviours (WF) were calculated as %T-units with Word Finding characteristics specified in [4]. A mixed model ANOVA was conducted with two between group factors (factor one was intervention/no intervention and factor two was EO/EAL) and one within group factor (three levels, before, at the end and one week after the intervention) using WF as the dependent variable. The *means* for all levels of these factors and the associated *sds* (in brackets) are given in Table 1. Assessment ($F(2, 24) = 39.02, p < .001, \eta^2_p = .765$) was the only significant main effect and it interacted with intervention group ($F(2, 24) = 5.08, p = .014, \eta^2_p = .297$). Inspection of Table 1 shows that WF scores dropped over the intervention and stayed at the low level one week after the intervention. This occurred for both intervention and no-intervention groups, but the interaction of assessment with intervention indicated that the drop was more marked for the intervention group.

Table 1. Word-finding behaviours results

		Mean %T-units			
		Control		Intervention	
		EO	EAL	EO	EAL
Assessment Phase	Pre-treatment	11.20 (5.63)	13.85 (4.32)	11.35 (1.95)	14.18 (3.71)
	Post-treatment	10.23 (2.20)	11.70 (4.38)	7.70 (2.43)	8.05 (3.43)
	1 week	9.57 (3.33)	8.57(3.66)	5.60 (1.65)	7.70 (2.11)
	follow-up				

A second analysis examined the same factors but used %WWR as the dependent variable. The *means* and *sds* are given in Table 2. Again assessment: $F(2, 24) = 21.80, p < .001, \eta^2_p = .645$ was the only significant main effect and it interacted with intervention group ($F(2, 24) = 6.16, p = .007, \eta^2_p = .339$). Table 2 shows that %WWR decreased for both groups, but the decrease was more marked for the intervention group.

Table 2. %WWR results

		Control		Intervention	
		EO	EAL	EO	EAL
Pre-treatment		8.18 (2.11)	7.30 (3.55)	8.10 (2.78)	7.20 (3.27)

Assessment phase	Post-treatment	7.60 (1.91)	6.73 (3.63)	4.15 (0.89)	4.93 (1.27)
	1 week	6.90	5.78	3.93	4.18
	follow-up	(1.89)	(2.98)	(0.50)	(1.57)

4. DISCUSSION

The present study showed that an intervention for WFD that used a mixture of semantic and phonic cues resulted in improvements in word-finding behaviours [4]) and it reduced WWR rates. The improvements relative to baseline occurred immediately post-treatment and were sustained over at least a one-week follow-up period. Similar, but smaller changes occurred for the non-intervention group.

These results suggest that this intervention has promise for addressing WFD and associated fluency problems irrespective of what language a child speaks. Several further features need to be examined. First, only word-finding behaviours have been reported and other measures in [4] need to be examined too. Second, a novel non-word test could be conducted at the end of testing similar to what was done for the training material to see whether the results generalized to non-familiar material. Third, children were matched for WFD across EO and EAL groups. The data in all analyses were inspected for language group differences, but none were seen (as expected). Other ways of selecting children for tests may have revealed differences. For example, instead of matching samples so that EO and EAL children had similar %WWR and the number was constant across language groups, children could be selected at random and differences in sample size could have been allowed. Differences across language groups might then arise for all the dependent variables (WF, %WWR). Fourth, language history was used as a matching factor; it too merits investigation. Further analyses could use children with the same native language to see whether this resulted in higher rates of code-switching (although the current procedure mitigated against this by having different languages spoken by the EAL children). Fifth, a typology of circumlocutions is needed and results with this should be examined for differences across language groups. Finally, the results with this intervention have been explained in terms of the WFD intervention having an effect on fluency. The recent systematic review on interventions used with EAL children [9] shows that the majority of them address reading/literacy. An efficacious intervention for reading that would not be expected to have an impact on fluency should be run to verify whether or not the current intervention is the only one that addresses fluency.

5. REFERENCES

- [1] Antonucci, S.. 2009. Use of semantic feature analysis in group aphasia treatment. *Aphasiology*, 23, 854-866.
- [2] Bryant, D., Goodwin, M., Bryant, B., Higgins, K. 2003. Vocabulary instruction for students with learning disabilities: A review of the research. *Learning Disability Quarterly*, 26, 117-128.
- [3] Francis, D., Clark, N., Humphreys, G. 2002. Circumlocution-induced naming (CIN): A treatment for effecting generalisation in anomia?. *Aphasiology*, 16(3), 243-259.
- [4] German, D. 1991. *Test of Word Finding in Discourse TWFD: Administration, Scoring, Interpretation, and Technical Manual*. DLM Teaching Resources.
- [5] Goodglass H., Kaplan E., Barresi B. 2001. Boston Diagnostic Aphasia Examination. 3rd ed. Lippincott Williams & Wilkins; Philadelphia.
- [6] Howell, P. 2013. Screening school-aged children for risk of stuttering. *Journal of Fluency Disorders*. 38, 102-123.
- [7] Howell, P., Tang, K., Tuomainen, O., Chan, K., Beltran, K., Mirawdeli, A., Harris, J. Identifying fluency difficulty and word-finding difficulty in children with diverse language backgrounds. Submitted.
- [8] Mirawdeli, A. In press. Identifying school-aged children who stutter or who have other difficulties in speech production in school reception classes. *Procedia, Social and Behavioral Sciences*.
- [9] Murphy, V. Unthiah, A. 2015. A systematic review of intervention research examining English language and literacy development in children with English as an Additional Language (EAL). Doi: https://educationendowmentfoundation.org.uk/uploads/pdf/EAL_Systematic_review1.pdf
- [10] Reilly, S., Onslow, M., Packman, A., Wake, M., Bavin, E., ...Ukoununne, O. 2009. Predicting stuttering onset by the age of 3 years: A prospective, community cohort study. *Pediatrics*, 123, 270 – 277.
- [11] Riley, G. 1994. *Stuttering severity instrument for children and adults (SSI-3)* (3rd ed.). Austin, TX: Pro Ed.
- [12] Salomone, A., Marsal, F. 1997. How to avoid language breakdown? Circumlocution!. *Foreign Language Annals*, 30, 473-484.
- [13] Wambaugh, J., Ferguson, M. 2007. Application of semantic feature analysis to retrieval of action names in aphasia. *Journal of Rehabilitation Research and Development*, 44, 381.

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