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EFFECTIVE STRATEGIES FOR WORD-FINDING INTERVENTION

by

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Submitted in Partial Fulfillment of the Requirements for the
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A disruption in the ability to expressively use known lexical items is called a word finding difficulty (WFD) (German, 2002). Difficulties in word finding behavior appear as hesitations, false starts, fillers, empty words, circumlocutions, phonological distortions, and semantic or phonological substitutions (Ebbels et al., 2012). According to Dockrell, Messer, George, and Wilson (1998) 23% of children on a speech-language pathologist's (SLP) caseload will have WFD behaviors. From time to time, children and adults may have difficulty thinking of a word or mistakenly call the "oven" an "onion" or the "total" a "turtle", a "chimney" a "pinnley" or a "camel" a "horse". Researchers have studied people with WFD in order to acquire normative data, characterize word finding behaviors and to develop efficient and effective intervention strategies to minimize word finding behaviors. Although it may be normal for WFD to happen periodically, some children and adults experience this more than others.

A WFD can impact many aspects of a child's life. It can negatively affect a child's oral communication and academic learning (German, 2002). For this reason, SLPs find it important to target a child's retrieval of words. Spoken language provides the primary skills for the acquisition of reading and writing (ASHA, 2001). Rubin and Liberman (1983) stated that special and general education teachers are troubled by students with poor word finding because they have difficulty retrieving verbal labels for printed words, this negatively affects their reading and written language skills (German, 2002). The reciprocity between spoken and written language suggests that all aspects of language can potentially be affected by a word finding deficit including morphology, phonology, semantics, pragmatics, and syntax (ASHA, 2001).

There are many questions this research paper strives to answer. How does a twelve year old access the correct word from a vocabulary of thousands of words at conversational speed? How are word-finding difficulties characterized? How do we provide intervention to children

who have WFD? What implications does research on word finding deficits have on communication as a whole?

Characterization of Word-Finding Difficulties

There are multiple investigations that focus on the communicative behaviors of children with WFD. The implications of the studies allow interventionists to target specific areas of a child's lexicon in order to show growth in their communicative abilities. There are three main types of errors: semantic substitutions, phonological errors, and don't know errors (McGregor, 1997). A semantic error is associated with less detailed semantic representations (McGregor, 1997). A phonological error is associated with word frequency and the frequency of its phonological neighbors (words with a similar phonological form) (German & Newman, 2004).

An investigation by Lahey and Edwards (1999) compared the proportion of error types across individuals with different language profiles. Individuals with expressive language deficits only resulted in a higher proportion of phonological errors than typically developing children. However, if the child had expressive and receptive delays they produced a higher proportion of semantic errors (Lahey & Edwards, 1999). The implications of this study have guided researchers to investigate the behaviors of children who make semantic and phonological errors separately, and it allows their results to generalize to specific error profiles.

Mcgregor (1997) investigated the communicative behaviors of twelve children with WFD and their age matched peers. They participated in tasks from the Test of Word Finding (German, 1989). The tasks assessed the naming of nouns, verbs, and naming in a story retelling task. The most common type of error in each error profile was semantic, for both groups. However, the WF group had lower error proportion of related semantic errors on the TWF-V and the story retell task.

Models of Word Retrieval, Semantic Processing, and Lexical Access

Generally speaking, most current adult models have two stages of word retrieval. In the first stage there is a semantic description of a concept which can be converted into a lexical representation (Nadeau, Gonzalez-Rothi, & Crosson, 2000). An example of a semantic description of the word "dog" would be barks, is furry and has four legs. These semantic descriptions are converted into a lexical representation, (i.e., "dog"). However, the word "dog" has not taken a phonological form. During the second stage, the lexical representation, or lemma, is converted into its phonological form. When there is a breakdown or failure to retrieve the target lemma for a given semantic description, the result may be the selection of another lemma and therefore creation of a semantic paraphasia (Nadeau et al., 2000). An example of this is producing "camel" instead of "horse." On the other hand, failure at the phonological level creates a phonemic paraphasia or "pinnely" for "chimney" ((Nadeau et al., 2000).

German (2002) based her intervention approach on the lexical architectural model and the lexical spreading-activation account. The lexical architectural model has four stages. The first stage is a conceptual representation of the target word. Second, processes transition from the concept to the lemma, where syntactic and semantic information is accessed. At stage three, the lemma accesses the phonological features (syllabic frame and sound units) to create a phonological plan. In the fourth stage, the phonological form is converted into the motor-planning system that allows the child to sequence the speech sounds motorically and produce the word. The objective of phonological intervention is to target the area between the lemma and the phonological representation (German, 2002).

The lexical spreading-activation account is a connectionist model. It states that there are at least two processes that happen to retrieve a word. There is priming and activation. Priming

requires subthreshold excitation and activation is threshold excitation. The purpose of priming is to prepare the word for possible activation. An activated word primes all other words associated with it (Burke, MacKay, Worthley, & Wade, 1991). The organization of the semantic system creates lexical neighborhoods. The two processes create the energy for selecting the phonological neighbor, also known as word cues that aid in word retrieval (German, 2002). For example, a word like mail would be in a dense neighborhood because it has many similar sounding words. Other words are considered to have sparse neighborhoods. The cognitive awareness of knowing one's phonological neighborhood will allow individuals to use priming as an explicit way to target the phonological features of a word.

Assessment of Semantic Errors

McGregor et al. (2002) measured the semantic representation of words children named correctly and words that were named with errors. Children were asked to draw and define the target word. The children produced less detailed drawings and definitions of the words with semantic errors. The link between a child's semantic representation and the child's ability to correctly name the word is described by Dockrell and Messer, (2007) who found that the proportion of word finding errors and the richness of the definition are equal.

The children with word finding deficits can define the same number of words as typically developing children; however, they describe perceptual features of objects rather than semantic categories (Dockrell, Messer, George, & Ralli, 2003).

Lastly, when (Dockrell, Messer, & George, 2001) asked children with WFD to name words with minimal semantic content, for example, letters and numbers, they did it as accurately and quickly as age matched peers. However, they performed poorer than age matched peers when naming pictures.

McGregor (2002) found that there are various reasons why these semantic errors happen. One thought is that there is a lexical gap. In other words, the child names an item with similarities to the picture. Another reason why a semantic error may happen is because the child fails to access the correct phonological representation while having good semantic representation (tip of the tongue). Lastly, the child could enter the semantic category, but retrieve the wrong word because there is not enough semantic representation (Lahey & Edwards, 1999). German and Newman (2004) found that this is not random. Factors that affect the outcome of retrieving the correct word in a semantic category depend on frequency of use, age of acquisition, and the amount of phonological neighbors.

Phonological Intervention

Phonological errors are less common than semantic errors (McGregor, 1997). Phonological errors are predicted by the word's frequency and the frequency of its phonological neighbors (German & Newman, 2004). The effect of phonological neighbors means that phonological representations containing less common phoneme combinations are more difficult to learn and store.

McGregor (1994) explored the use of phonological information to develop an intervention for word finding difficulties. The intervention was validated by a single-subject multiple baseline design across behaviors and subjects. The participants were two children ages 4:9-5:0. Each child had approximately 70% semantic substitutions (e.g., tool for wrench or square for rectangle) and 10% phonological errors (e.g., compeller for propeller). The remainder consisted of circumlocutions and no responses (McGregor, 1994).

McGregor (1994) hypothesized that both semantic and phonological word-finding errors could be reduced by enhancing the phonological output lexicon. The materials consisted of two

sets of 24 black and white line drawings from Achiev Red and Achiev Blue preschool vocabulary sets. The boys were receptively able to identify the drawings. Each of the two sets of stimuli was organized into groups of eight based on their function i.e., target training words, semantically related words, and phonologically related words). The procedure began by establishing baseline during which the children attempted to name each word set as quickly and correctly as possible. The procedure required the child to produce the first sound in the name of the depicted object and determine the number of syllables in the target word. Next, the child received a card with a number one or three on it. These visuals were used to aid the child to tap out the correct number of syllables. The second approach was to instruct the child to think about the first sound in each word. If the response was in error, the child was cued with the number of syllables or the sound of the first letter. Results indicated that phonologically based intervention served to reduce semantic substitutions on treated sets. Three weeks after therapy the amount of errors were measured again and indicated comparable results (McGregor, 1994).

A phonological based strategy by German (2002) used segmentation, phonological neighbor cues, and rehearsal to treat word finding difficulties. The investigator used a single subject-multiple baseline design across participants. Two eight year old, monolingual, English speaking, Caucasian boys were the participants. Each boy received word finding intervention at his school twice per week. The majority of these sessions focused on target word rehearsal using picture naming and open-ended sentences supported by phonemic cueing. German (2002) investigated this by giving each child a qualitative analysis of their word finding behaviors. The responsiveness to phonemic cueing, ability to recognize and repeat target words, and the nature of incorrect responses were assessed. The author concluded that the child's word finding behaviors might be from failure to access the correct forms of the target words.

The procedure used in German (2002) was three pronged. Metalinguistic knowledge, such as number of syllables, was paired with phonemic neighbor cue words and rehearsal. An example of this would be help-mit for helmet. The materials used included eight sets of treatment and nontreatment word lists (four each). The word lists were age appropriate and considered challenging. Each child was seen individually for four 30 minute treatment sessions. Five training words were presented during each session. Previous words taught were reviewed at the beginning of each session. Syllable dividing, linking target word or syllable to the phonemic neighbor, and rehearsal were all used as treatments. Overall the results of the intervention were effective.

Semantic Intervention

Ebbels et al. (2012) hypothesized that a semantic approach should be effective, particularly for children who mostly make semantic errors. The authors also wanted to determine if children receiving semantic therapy made more progress than those who received no therapy for word finding difficulties. Participants included 15 secondary aged individuals between 9:11 and 15:11 with a mean age of 13:5. The participants were from a residential school for people with severe language impairments. The standardized test used for inclusion was the Test of Adolescent/Adult Word Finding (TAWF). Other standardized tests included Clinical Evaluation of Language Fundamentals-3UK, British Picture Vocabulary Scales-II, and the Phonological Awareness Battery Semantic Fluency. All children had general receptive and expressive language difficulties. The Test of Word Finding in Discourse was informally used because the children fell outside the age range. Intervention occurred twice per week in 15 minute durations for eight weeks for the treatment group. The materials in the treatment included photo cards of animals, food, and clothes. During the first intervention session of the week, the participant

sorted pictures. First, he/she sorted by broad semantic categories and then by narrower semantic categories. Afterwards, he/she discussed the semantic attributes of the pictures, and then compared pictures in terms of these attributes and categories in a game. Games were added to increase motivation. Various speech-language pathologists administered the intervention and the games played were dependent on the therapist. The control group did not receive any therapy until later in the program. Results indicated that the treatment group improved more than the waiting treatment group did. The treatment group made progress which was significantly greater than zero (Ebbels et al., 2012). When the treatment group's results were compared to the pretest for the Test of Word Finding in Discourse (TWFD) there was limited change on all measures (Ebbels et al., 2012). In phase two, the authors compared the treatment group to the waiting for treatment group. The results indicated that the controls made similar amounts of progress once the intervention took place (Ebbels et al., 2012). Although the results indicated no generalization to discourse, the strong research design added validity to the study.

Narrative Based Intervention

Marks and Stokes (2010) used a single-subject ABA design to test the effects of narrative based language intervention focused on word finding (NBLI-WF). The participant was 8:01 years old. The participant had an overall delay in expressive and receptive language which was not commensurate with his cognitive, motor, or social development. He displayed difficulty with expressive and receptive language at the single word, sentence, and discourse level. However, the Test of Word Finding- 2 indicated a discrepancy between picture naming and sentence completion compared to comprehension. The materials used include a 24-picture storybook without words, titled, *Frog, Where Are You?* Prompts were used to continue the narrative sample. The narrative sample is organized into two categories, language productivity and number

of word finding characteristics. The total number of words included repetitions, empty words, reformulations, and substitutions. Time fillers, initial sound repetitions, and initial conjunctions were not used. The procedure used was adapted from Narrative Based Intervention outlined by Swanson, Fey, Mills, and Hood (2005). The procedure utilized the story imitation, sentence imitation and story generation tasks. The story retell task required the SLP to read the story to the participant. A series of pictures were placed in front of the participant. The participant was instructed to point to the appropriate picture when he heard the target word in the story. The purpose of story retell imitation task was to have the participant show understanding of the story's main ideas and correct production of the target words. In the sentence imitation task the participant was asked to imitate two sentences for each treatment word. The first sentence was definitional in nature and the second was contextual. The story generation task required the participant to create his own story using three or four of the treatment words. Each word was used in one story over the total of eight sessions. Results indicated that there were 33 pre-therapy word finding characteristics and 25 post-therapy word finding characteristics (Marks & Stokes, 2010).

Retrieval and Elaboration Intervention

McGregor and Leonard (1989) investigated four children ages 9:1 to 10:5. Two children received word finding intervention while the other two children did not. The two groups were matched for age and language abilities. Inclusion criteria included a score of one standard deviation below the mean for receptive language and expressive language spoken quotient. In addition, the child needed to score more than one standard deviation below the mean accuracy score but above the 90% correct comprehension on a test of word finding. All of the children participated in a pretest, posttest, and maintenance test. All children received therapy; however,

children in the control group received language therapy and not word finding therapy. One hundred twenty words were selected for the study, all concrete nouns represented by pictures. All words were comprehended by the children. The words selected were moderately frequent in the English language. The 120 words were broken into four groups of 30 words. The purpose of this was to test elaboration, retrieval, elaboration and retrieval, and a control to measure progress. To test elaboration, activities were designed to teach the child new information about a word. The investigators used rhyming words, appropriate exemplars, similarities, and differences from semantically related words to facilitate elaboration. The authors used retrieval activities to use information already known by the participants. This included the superordinate category of the word, customary location of its referent, and the initial sound of the word. The results of the study showed that treatment effects had the greatest gains with activities that focused on both elaboration and retrieval (McGregor & Leonard, 1989)

Comparison between semantic and phonological intervention

In the study conducted by Wing (1990), 10 children ages 5:11-7:1 enrolled in a self-contained language impaired class were split into two groups and compared against age-matched peers. Five of the children were placed in the semantic intervention group and the other 5 were placed in the phonological/perceptual group. Materials used for the semantic group included the commercially available Category Cards, Association Cards, Part-Whole Cards (DLM Teaching Resources), and pictures from the Peabody Kit grade one (American Guidance Service) (Wing, 1990). The procedure implemented required the experimenter to help the children learn to place picture cards into categories, to name as many words as possible in a given category, to supply attributes to describe animals and objects, and to use categories and attributes to define words. The associated pictures were of objects related by common function, composition, attribute, or

by part-whole relation (Wing, 1990). The materials used for the phonological/perceptual

(imagery) training included pictures from a picture dictionary mounted on a 7 ½ x 10 cm card.

Rhyming Objects, Ideal and Rhyming Cards (DLM/ Teaching Resources) were also used.

The phonological segmentation activities required the participants to say a word out loud

and segment the multisyllabic or monosyllabic word while touching a series of small squares.

The children counted the number of syllables. The children also matched rhyming words with

objects and pictures (Wing, 1990).

The imagery techniques for the semantic group used the same materials as the

phonological group. The experimenter read the names of the words out loud. Once all the

children remembered their objects, they were instructed to put the card down and to visualize the

picture in their minds, and imagine the voice naming it. After 20 seconds, the participants were

asked to repeat the word. The participants were asked to pick out the picture from a group of six

pictures to reinforce visual images.

The posttest was administered after 30 treatment sessions spanning 2 ½ months. There

was a significant difference between the pre- and post-test score for the phonological/perceptual

group; however, the semantic group's increase between pre- and post- tests was not significant

(Wing, 1990). Participants of the phonological/perceptual group increased their scores by 39%

(Wing, 1990). Participants of the semantic group increased their scores by 20% (Wing, 1990).

While both groups displayed an increase in word finding skills, the phonological/perceptual

intervention outperformed the semantic intervention in children with language impairments.

Wing (1990) supports the claim that phonological word finding strategies are more

effective than semantic word finding strategies. This finding may be due to the nature of the

participants' word finding errors. For example, if a child has age-appropriate receptive

vocabulary and intact semantic organization then the child will not benefit from intervention that targets semantic organization (Murphy, Pollatsek, & Well, 1988).

Mnemonic Intervention

Careful assessment and characterization of an individual's strengths and challenges can depict an error profile which can be targeted with a specific technique that research has proven effective, such as phonological or semantic based intervention. The breakdowns at different points in the word retrieval process can help categorize children's word finding errors. These error profiles may help to tailor intervention for the child. According to German (2000), there are three subtypes: retrieval difficulties, comprehension difficulties, and comprehension and retrieval difficulties

German (2000) states that retrieval aspects of word finding intervention focus on information the child already knows about the word. A concrete example, found in McGregor and Leonard (1989), supports superordinate categories and initial sound of the word as retrieval strategies. Semantic intervention focuses on the comprehension aspect of word finding and a combination of the two would be beneficial for individuals with comprehension and retrieval difficulties. One way to incorporate both semantic and phonological cues and aid the semantic memory is by training vocabulary words using mnemonics.

Scruggs and Mastropieri (2000)describe three mnemonic strategies that aid in vocabulary learning of students with special needs. The three strategies include the keyword method, the pegword method, and letter strategies. The keyword method involves taking the new word and creating a word that is easy to picture or also known as a concrete picture. This concrete picture is already known by the learner. Next, create a situation where the definition interacts with the keyword. An example given by Scruggs and Mastropieri, (2000) is the word peavey. Pea is a

concrete keyword and the definition of peavey is a type of hook. Picture a hook with peas on it. The idea of creating a concrete word that sounds like the word or part of the word supports the spreading activation theory previously described. It uses the phonological neighborhood to aid in word finding.

This method was tested by Uberti, Scruggs, and Mastropieri (2003). These authors investigated the impact of the keyword method as applied to an entire classroom activity involving story reading and discussion. The authors believed that the keyword method will increase the learners' vocabulary acquisition. Sixty-four general education students and ten special education students participated in the study. The participants were placed in three classrooms. The first classroom consisted of 26 students including four students with learning disabilities. The second classroom consisted of 23 students including four with learning disabilities. The third classroom had 25 students including two with learning disabilities. All students were in the third grade. Ten vocabulary words were selected from an age appropriate literacy piece. Class 1 received the vocabulary word printed on a separate sheet of paper. On the paper was the vocabulary word, a keyword, a short definition, and a picture that somehow related the keyword to the definition. Class 2 received the vocabulary word, the definition, and a representational picture. Class 3 received the word and the definition without the keyword or any picture. A pretest and a posttest were administered to assess prior knowledge. The keyword classroom (Class 1) received vocabulary cards one at a time with the word read to them and the keyword pointed out. Then, the picture was explained. The keyword, vocabulary word, and definition were practiced three times. A similar pattern was given for the other two classrooms. The results indicated that students with learning disabilities benefited greatly from the keyword method (Uberti, Scruggs & Mastropieri, 2003)

Conclusion

There are many different interpretations of word finding. Many of the models are similar but have differences. The organization of the semantic system and the qualitative analysis of a participant's responsiveness to word finding cues help determine the intervention approach most appropriate for a child. In short, retrieval strategy instruction, self-advocacy instruction, and word finding accommodations may be the most appropriate interventions for children with word finding difficulties. This paper reviewed various articles that focus on semantic, phonological, narrative based, and mnemonic interventions. Children with semantic substitutions can be helped by enriching their representations through similarities, labeling, associating, categorizing, differences, multiple meanings, and attributes. Phonological forms can be enhanced by initial phoneme cueing, segmentation of syllables, phonological neighbors, and perceptual cues. The investigations show maintenance of the intervention, however, generalization of the technique to nontreatment words has been a challenge. Also, there are some external and internal validity concerns that weaken the integrity of some of the investigations. The future direction of word finding investigations should focus on the generalization aspects of treatment.

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