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Cueing Hierarchy as an Effective Treatment Approach in the Treatment of Anomic Aphasia

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Introduction

One of the most common devastating features of aphasia is impairment in the ability to retrieve words (Davis, 2000), whether it involves naming seen objects, or producing nouns, verbs and other words conveying meaning in spontaneous propositional speech (Goodglass, 1993). The clinical literature comprises of many reports of therapeutic approaches which have successfully been employed in reducing the word retrieval difficulties of aphasic patients (Keenan, 1966; Croskey and Adams, 1969), as well as reports of strategies which these patients employ spontaneously in their efforts to retrieve a desired word (Marshall, 1976).

One of the principles that formed the foundation of the development of the word-retrieval program follows the notion that, the elicitation of a response is a major concept of aphasia rehabilitation. This suggests the fact that by eliciting the desired response with minimal cue helps in the recovery process. Hence to achieve utmost benefit from stimulus presentation, the patients are expected to retrieve the desired word with minimum external facilitation than required; leading to the concept of “stimulus power” (Bollinger and Stout, 1976). During the development of the research reported here, cues were drawn from different communication areas such as gestural, phonologic, semantic, orthographic - and were hierarchically arranged according to stimulus power. Various factors were considered before the implementation of the stimulus power – number of repetitions of the cue, number of input

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modalities, contextual constraints, and the form in which they were provided (descriptive statement; sentence completion; closed-end questions, etc.).

However, the stimulus power varies with respect to each individual patient; hence the cueing hierarchy that is appropriate for one patient may not be appropriate for another. Thus it is essential that the stimulus power for a wide variety of cues be assessed for each patient, and subsequently a cueing hierarchy be individually structured.

Importance and Relevance of Cueing

Rosenbek, LaPointe and Wertz (1989) consider cueing to be the heart of aphasia treatment. According to them, the cue which has the lowest stimulus power should be presented first, followed by increasingly powerful cues until the desired response is elicited. Hence the objective is to elicit the desired response with the least powerful cue. A study conducted by Wiegel-Crump & Koenigsnecht (1973) used cueing as a primary treatment approach for word retrieval problem and concluded that the naming deficit exhibited by their patients was indicative of an access problem or an underlying loss of efficiency in retrieval words from the lexical store.

Also Linebaugh and Lehner (1977) suggested that stimulation of word retrieval could be achieved with the presentation of minimal cues which indirectly require greater concentration. The patient is required to concentrate on the intended word with minimal assistance from the clinician. The presentation of the cues in therapy sessions moves from minimal cueing to more redundant cues.

Howard and Orchard-Lisle (1984) proposed three ways by which cueing may have an effect on aphasia treatment: (1) cues may have a “prompting” effect; (2) cues may have an effect at a later point in time - a “facilitation” effect; or (3) cues may have a permanent effect, not only on the target word, but also generalized to other words - a “therapeutic” effect.

Hickin, Best, Herbert, Howard & Hillis (1989) and Osborne (2002) suggested that in order to achieve this therapeutic effect, the cues should be repeatedly applied following a hierarchical format from least informative to most informative (e.g., first phoneme, first syllable, whole word for repetition).

Different types of Cueing as treatment for naming deficits

In many single and multiple case studies the long-term effect of semantic cueing treatment on naming was established, not only on trained but also on untrained items (Drew & Thompson, 1999; Coelho, McHugh, & Boyle, 2000; Wambaugh et al., 2001).

Thompson, Raymer & LeGrand (1991) developed a phonological treatment and indicated improved naming of trained items and some evidence of generalizations to untrained items.

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Hickin et al (2002a) & Hickin et al (2002b) have noted positive effects of phonological techniques in word-retrieval strategies and also feel treatment based on orthographic cues to be equally or more effective than treatment based on phonological cues (Basso, Marangolo, Piras & Galuzzi, 2001).

Howard et al (1985) devised a study which examined separate semantic and phonological treatments sequentially in a group of 12 patients with varied aphasic classifications and found significant improvement in them.

According to Wambaugh et al (2004), phonological and semantic cueing treatments may have utility in facilitating action naming for some individuals with aphasia, but the effects may vary across speakers.

Nickels (2002) has opined that the combination of semantic and phonological techniques may prove to be most effective. Patterson (2001) revealed the evidence for the effectiveness of cueing hierarchies, and also that the technique is useful across individuals with a variety of word finding and naming impairments.

According to Avila et al (2001), when a person with aphasia experiences difficulties in finding a word, a semantic, phonological or orthographic cue may provide additional information and help to activate the target word above threshold.

This multicue approach to tailor therapy provides individuals with aphasia with a range of different cues and encourages them to discover for themselves which cues they find most suitable. This may enable them to develop self-cueing strategies by internalising the relevant parts of the cueing system.

Need to Develop Appropriate Blend of Cues

With a variety of hierarchy of cues used in the literature, it is essential to arrive at a consensus about the appropriate blend of cues which can be achieved with a case-study design. The traditional approach to treat word retrieval problems has been focused on semantic/phonologic/orthographic cueing or any combination of them. This study also explores the effectiveness of using a hierarchy with both semantic and phonological cues. Hence the aim of the present study was to introduce a cueing hierarchy and to examine its effectiveness in therapy by comparing the pre and post therapy response time.

Methodology

The present study was conducted at the Kasturba Medical College, Mangalore. Institutional ethical board approved the study and the informed consent was obtained from the subjects before the commencement of the study.

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Subject Description

The present paper is a prospective control study done on a 31 year old right handed male subject (AH). The subject presented with a complaint of not speaking clearly since eight months post-stroke. Medical history revealed that he had a left middle cerebral artery occlusion leading to an infarct in the left basal ganglia. He also had a right sided hemiparesis.

Evaluation

The demographic details were collected and an oro-motor evaluation was carried out as part of a routine assessment. AH exhibited weakness in his right facial muscles, with a poor lip closure, having a structural deviancy towards his affected side, along with restricted speed and range of the tongue movements and inadequate intra-oral breath pressure. The deficits in his oro-motor system had a corresponding influence on his articulatory precision as well. An informal articulatory test revealed the presence of distortion for almost all the sounds of his language. Language assessment was done with Western Aphasia Battery (WAB) by Andrew Kertesz (1982). WAB is a language test for individuals between 18-89 years of age testing the language abilities in a variety of sections – fluency, auditory verbal comprehension, repetition, naming, reading, writing, apraxia and construction. The type of aphasia can be determined based upon the aphasia quotient which the individual attains after he has been scored for the first 4 sections.

The Present Study

In the present study, the subject attained relatively better score in auditory verbal comprehension than the other sections. Though he was able to convey adequate information, he had evident semantic and phonemic paraphasias. His repetition skills were poorer for longer phrases and sentences. He had confabulatory errors in naming skills, being unable to define referents even with adequate semantic cues and also had prolonged reaction times for other naming tasks. Deficits were also observed for phonemic and semantic categorical naming. Response times were prolonged for automatic closure tasks. For a lexical fluency task which involves the individual to retrieve and produce items from a particular category in 60 seconds, the subject was only able to retrieve 2 items. Hence a diagnosis of ‘Anomic aphasia’ was arrived at, based on the taxonomic classification of aphasia of WAB.

Procedure

Speech therapy was initiated with oro-motor strengthening exercises given to improve the muscular control of the subject’s oral mechanism. As language was the area of study, a structured approach was planned which consisted of 4 phases:

Phase 1: Stimuli selection

A list of nouns (4 items from eight lexical categories – animals, body parts, clothing, household items, vegetables, fruits, vehicles and professionals) and action verbs (16 items)

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were selected as the stimuli for the experiment, and pre-therapy baselines of the response time to name the respective words (pictorial representation) were noted during the course of two sessions. The stimuli for the task was adapted from an early language training kit “With a Little Bit of Help”, developed by Karanth, Manjula, Geetha & Prema (1999). The lists of words selected for the study are shown in the following table (Table1).

NOUNS				ACTION VERBS	
Dog	Shirt	Onion	Car	Playing	Combing
Elephant	Pants	Carrot	Bus	Washing	Running
Monkey	Chappal	Tomato	Train	Swimming	Brushing
Horse	Cap	Potato	Scooter	Jumping	Eating
Tongue	Kitchen	Mango	Doctor	Drinking	Writing
Ear	Bathroom	Banana	Policeman	Reading	Climbing
Nose	Chair	Apple	Carpenter	Flying	Standing
Finger	Table	Orange	Postman	Sweeping	Sitting

Table 1: The stimuli list comprising of nouns and action verbs used for the present study

Phase 2: Estimation of stimulus power

Subsequently the stimulus power was obtained for each of the listed words. This was achieved by trying to elicit the desired response using varying language areas such as – semantic and phonologic cues and thereby grading their contribution to elicit the target response. After the establishment of the stimulus power for each of the categories, it was arrived at a consensus that semantic cueing is to be used first followed by phonological cueing, in order to follow an appropriate hierarchy to elicit a word. The phonological cueing comprised of rhyming and phonemic cueing, indicating that the subject responded better in the latter than the former. Semantic cueing consisted of describing the target item in terms of its color/features/size/category/etc.

Phase 3: Implementation of cueing hierarchy

The constructed cueing hierarchy was employed as part of the intervention program. The words were presented using a confrontation naming task. Figure 1 shows the hierarchical pattern of the organization of the cues for the subject. The subject was presented with pictures in random, using a simple random generator. This order of presentation was chosen to avoid effects of neighbourhood activation. The subject was asked to name the particular picture shown to him. Whenever there was a failure to name the target picture, semantic cueing was provided. On failure to name with the semantic cue, a rhyming cue was presented. Following this, a phonemic cue was presented on subsequent failure with the rhyming cue. Finally if necessary, the target word was modelled and the subject was asked to repeat. The intervention program was carried out for 15 sessions, each comprising of 1 hour for speech and language therapy (15 min of oro-motor exercises/articulation therapy and 45 min of language therapy)

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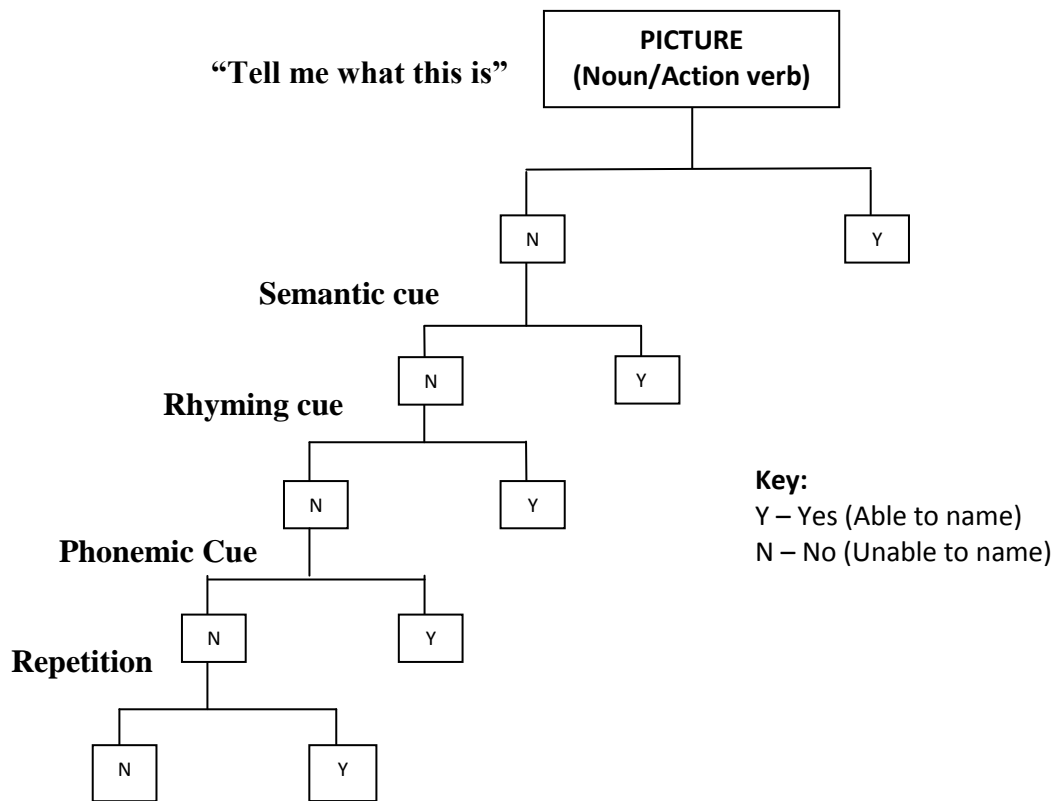


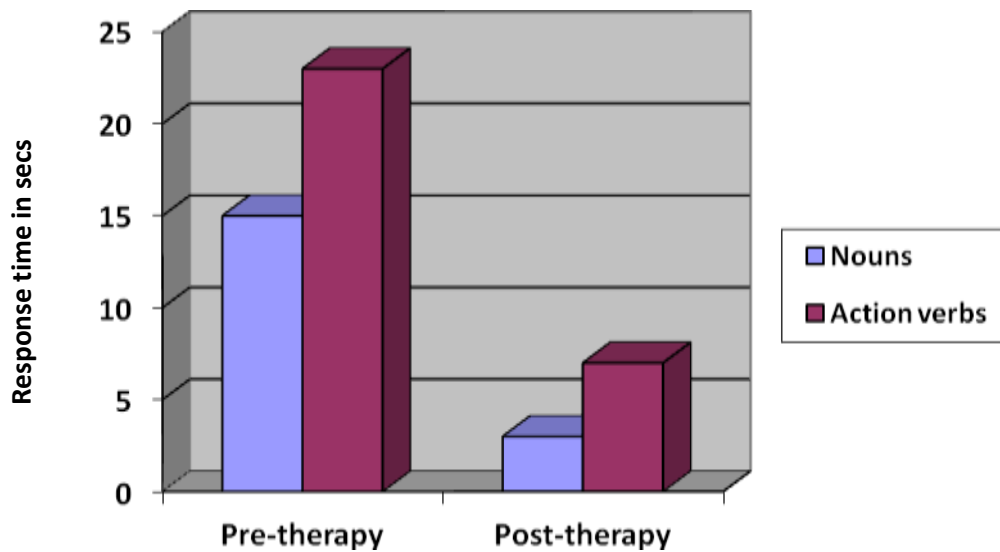
Fig I: Flowchart explanation for cueing hierarchy which was used to improve lexical retrieval

Phase 4: Tabulation of the results

The post therapy response time was obtained for the same words. The pre and post therapy results were compared and tabulated.

Results

The present study was carried out to find out the efficacy of using a structured cueing hierarchy for a subject having anomic aphasia. Nouns and action verbs were used as the stimuli for the study and a baseline response time was obtained of naming each of words. Subsequently, semantic and phonological cues were used to determine their position wherein which they have to be employed in the cueing hierarchy. The cueing hierarchy was constructed after preliminary probing to determine the more or less effective cues for the individual. Language intervention continued for 15 sessions, the post-therapy response times were also noted and compared to the pre-therapy response times.



Confrontation naming task

Figure 2: Pre and post therapy response times to name nouns and verbs in a confrontation naming task

As shown in figure 2, a considerable improvement was seen in the confrontation naming tasks for both noun and action verbs. The blue bar indicates the mean response time to name nouns in both pre and post therapy conditions; and the red bar indicates the mean response time to name action verbs. As a whole, the client's performance after therapy was better in semantic categorical naming than in phonemic categorical naming. Significant improvement was also seen in tasks pertaining to lexical fluency, in which he was able to name 9 items (post-therapy), when compared to 2 items (pre-therapy) in 60 seconds.

Discussion

The organization of language in an individual depends upon various components such as phonology, semantics, syntax-morphology and pragmatics. Every component has its own relevance in the usage of language. Semantics forming the content of language contains nouns and verbs as a core vocabulary for the formulation of language. Studies have been done focussing on the significance and the time taken to produce nouns and verbs in the normal populations (Deepa et al, 2011). However, considering disorders such as aphasia, the retrieval of target words such as nouns and verbs can be mainly affected.

The efficacy of using cues in order to elicit an easy retrieval of a target word has been the focus in many studies (Wiegel-Crump & Koenigsnecht, 1973; Rosenbek, LaPointe and Wertz, 1989; Coelho, McHugh, & Boyle, 2000). The cues to be included in a therapy program will depend upon its effect on the patient, and cannot be generalised to all. The

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present study focuses on the inclusion of semantic and phonological cueing in a hierarchical format.

The results of this study revealed a positive effect of using both types of cueing in the elicitation of nouns and action verbs, after an intensive intervention program that lasted for a period of 2 months. Howard & Orchard-Lisle (1984) suggested that cues can have a permanent effect, not only on target words but also on other words. Though our study did not focus on permanent effect on other words, we did observe a significant positive effect on the target words that comprised of nouns and action verbs.

Although much is known about the efficacy of different cueing techniques on naming, it is not fully understood which cues are suitable for which individuals. A simple association cannot be derived to link the loci of impairment with the type of cue to be used. Semantic techniques can improve naming for individuals with good semantic processing (Nickels & Best, 1996) and phonological tasks can improve naming for individuals with semantic impairments (Raymer, Thompson, Jacobs, & Le Grand, 1993).

Hence even in the present study AH benefited with semantic and phonological cues to elicit the retrieval of a semantic word. Doesborgh et al (2004) also have reported similar findings, in which they investigated the effects of multicue for a short period with minimal therapist involvement in persons with chronic aphasia and found a beneficial effect on word finding in picture naming. The present study also is supported by the evidence provided by Howard et al (1985), Nickels (2002), and Wambaugh et al (2004) suggesting the positive effect of semantic and phonological cues in the word-retrieval.

Conclusion

The treatment for word finding difficulties is focused on therapy approaches that include different types of cueing. One such cueing strategy that was used, included cueing based on a particular hierarchical format, which depends upon the patient's severity of the lexical retrieval. It comprised mainly of semantic and phonological cues. As noted in the present the study, the patient exhibited significant improvement after the introduction of this particular hierarchical format. Hence using a combination of cues is always better than using one in isolation.

Though this study could establish a permanent effect on the target words using the selected cues, it did not focus on the generalization on other words. The effect of cueing treatments on verbal communication is also unknown. Only a handful of work has been done explicitly looking at the generalisation to spontaneous speech, with contradictory results. Hence it would have also been interesting to study its generalisation to spontaneous speech rather than just restricting it to a naming task. Future research has a wide scope to develop a plethora of strategies after considering all the previously mentioned aspects.

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References

- Avila, C., Lambon Ralph, M.A., Parcet, M.A., Geffner, D. & Gonzalez-Darder, J.M. (2001). Implicit word cues facilitate impaired naming performance: evidence from a case of anomia. *Brain and Language*, 79 (2), 185-200.
- Basso, A., Marangolo, P., Piras, F. & Galuzzi, C. (2001). Acquisition of new 'words' in normal subjects: A suggestion for the treatment of anomia. *Brain and Language*, 77 (1), 45-59.
- Bollinger, R. L. and Stout, C. E. (1976). Response-contingent small-step treatment: Performance based communication intervention. *Journal of Speech and Hearing Disorders*, 41, 40 – 49.
- Coelho, C.A., McHugh, R.E., & Boyle, M. (2000). Semantic feature analysis as a treatment for aphasic dysnomia: A replication. *Aphasiology*, 14, 133–142.
- Croskey, C.S. & Adams, M.R. (1969). A rationale and clinical methodology for selecting vocabulary stimulus material for individual aphasic patients. *Journal of Communication Disorders*, 2, 340 – 343.
- Davis, A. (2000). *Aphasiology*. Englewood Cliffs, NJ: Prentice Hall.
- Devadiga, D.N., Kumar, B.R., Bhat, J.S. and Sengolraj, L (2011). Speed of Processing in Adults: Comparison across Grammatical Category. *Language in India*, 11.
- Doesborgh, S.J.C., van de Sandt-Koenderman, M.E., Dippel, D.W.J., van Harskamp, F., Koudstaal, P. J. & Visch-Brink, E. (2004b). Cues on request: the efficacy of multicue, a computer program for wordfinding therapy. *Aphasiology*, 18 (3), 213-222 (10).
- Drew, R.L., & Thompson, C.K. (1999). Model-based semantic treatment for naming deficits in aphasia. *Journal of Speech, Language and Hearing Research*, 42, 972–989.
- Goodglass, H. (1993). *Understanding Aphasia* (pp. 77-101). London: Academic Press.
- Hickin, J., Best, W., Herbert, R., Howard, D. & Osborne, F. (2002a). Phonological therapy for word-finding difficulties: A re-evaluation. *Aphasiology*, 16, 981 – 999.

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- Hickin, J., Herbert, R., Best, W., Howard, D., & Osborne, F. (2002b). Efficacy of treatment: Effects on word retrieval and conversation. In S.Byng, C.Pound, & J.Marshall (Eds.), *The aphasia therapy file 2*. Hove, UK: Psychology Press.
- Hillis, A.E. (1989). Efficacy and generalization of treatment for aphasic naming errors. *Archives of Physical Medicine and Rehabilitation*, 70, 632–636.
- Howard, D. & Orchard-Lisle, V. (1984). On the origin of semantic errors in naming: Evidence from the case of a global aphasic. *Cognitive Neuropsychology*, 1, 163 – 190.
- Howard, D., Patterson, K., Franklin, S., Orchard-Lisle, V. & Morton, J. (1985). Treatment of word retrieval deficits in aphasia: A comparison of two therapy methods. *Brain*, 108(4), 817-829
- Karant, P. (2007). With a little bit help – An early Language Training Kit. *Journal of Rehabilitation Council of India*, Vol 3, No 1 & 2, RCI: New Delhi.
- Keenan, J.S. (1996). A method for eliciting naming behavior from aphasic patients. *Journal of Speech and Hearing Disorders*, 31, 261 - 266
- Linebaugh, C. & Lehner, L. (1977). Cueing hierarchies and word retrieval. In R. H. Brookshire (Ed.), *Proceedings of the conference on clinical Aphasiology* (pp. 248-31). Minneapolis: BRK Publications.
- Marshall, R. C. (1976). Word retrieval behavior of aphasic adults. *Journal of Speech and Hearing Disorders*, 41, 444 – 451.
- Nickels, L. (2002). Therapy for naming disorders: Revisiting, revising, and reviewing. *Aphasiology*, 16 (10 & 11), 935 – 979.
- Nickels, L., & Best, W. (1996). Therapy for naming disorders (Part II): Specifics, surprises and suggestions. *Aphasiology*, 10, 109–136.
- Patterson, J. P. (2001). The effectiveness of Cueing Hierarchies as a treatment for word retrieval impairment. *Neurophysiology and Neurogenic Speech and Language Disorders*, 11, 11-18.
- Raymer, A. M., Thompson, C.K., Jacobs, B., & Le Grand, H.R. (1993). Phonological treatment of naming deficits in aphasia: Model-based generalization analysis. *Aphasiology*, 7, 27–53.
- Rosenbek, J., LaPointe, L. & Wertz, R. (1989). *Aphasia, a clinical approach*. Austin, TX: ProEd.

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- Thompson, C. K., Raymer, A. & LeGrand, H. (1991). Effects of phonologically based treatment on aphasic naming deficits: A model-driven approach. *Clinical Aphasiology*, 20, 239 – 261.
- Wambaugh, J., Linebaugh, C., Doyle, P., Martinez, A., Kalinyak-Fliszar, M., & Spencer, K. (2001). Effects of two cueing treatments on lexical retrieval in aphasic speakers with different levels of deficit. *Aphasiology*, 15, 933–950.
- Wambaugh, J., Cameron, R., Kalinyak-Fliszar, M., Nessler, C. & Wright, S. (2004). Retrieval of action names in aphasia: Effects of two cueing treatments. *Aphasiology*, 18(11), 979–1004.
- Wiegel-Crump, C. and Koenigsnecht, R. A. (1973). Tapping the lexical store of the adult aphasic: Analysis of the improvement made in word retrieval skills. *Cortex*, 9, 410-417.

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