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## **The Effects of Increasing and Decreasing Cue Therapy on Improving Naming Abilities in a Malayalam Speaking Person With Aphasia**

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### **Introduction**

Aphasia is an acquired language disorder in which there is an inability to express /comprehend spoken or written language. Aphasia may occur secondary to brain injury or degeneration and involves the left cerebral hemisphere to a greater extent than the right (Howard, 2009) Most aphasias and related disorders are due to stroke, head injury, cerebral tumors, or degenerative diseases. Aphasia syndromes have been described based on patterns of abnormal language expression, repetition, and comprehension. Patients may lose the ability to produce speech, to comprehend speech, to repeat, and to hear and read words in many nuanced ways. One of the most common deficits exhibited by patients with aphasia is the inability to name which is termed as 'anomia' (Abel, Schultz, Radermacher, Willmes & Huber, 2005).

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## **Role of cueing in treatment of lexical retrieval deficits**

Anomia, also known as a lexical retrieval deficit, is a phenomenon whereby an individual can usually supply an accurate semantic representation of an object, but they are unable to verbally label that same object (Saito & Takeda, 2001). This deficit is the main feature of anomia, however it is also a common problem in other types of aphasia (Abel, Schultz, Radermacher, Willmes & Huber, 2005). In all cases, this deficit can significantly impact the patient's verbal communication. Various group studies reveal that, cueing techniques can be ordered hierarchically according to their postulated effectiveness in assisting immediate lexical access (Shewan & Bandur, 1994; Abel, Shulz, Radermacher, Willmes, & Huber, 2005). Levelt et al. (1991) claim that lexical access involves two stages: lexical item selection, which accesses the syntactically and semantically appropriate representation of the word, and phonological encoding of the selected item, which allows for its verbal articulation. Cueing is a common facilitation technique for impaired naming. Phonemic and semantic cueing are the two most common types of treatment involved in treating naming deficits in individuals with aphasia. In phonemic cueing the initial phoneme or syllable is presented to the patient having difficulty finding a word, whereas semantic cueing involves tasks like answering yes/no questions pertaining to the meaning of the target. Phonologic and semantic cueing therapies are based on the theory of lexical access and are widely used for remediation of word finding deficits in aphasia.

### **Phonologic vs. Semantic Cueing**

Researchers have documented facilitating effects of both phonologic and semantic cueing (Li & Williams, 1989). Howard and colleagues (1985a) contrasted semantic and phonological facilitation techniques. All facilitation activities were generated and provided by the experimenter. Overall naming performance was significantly better as a result of semantic treatment conditions, as was generalization to untreated items, although the degree of generalization was small. Marshall and colleagues (1992, 1994) explored the effects of various

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cueing techniques on the ability of subjects with aphasia to name arbitrary word-symbol pairs. In both studies, nouns and verbs were arbitrarily matched to novel symbols, with naming of those symbols serving as the dependent variable. Marshall et al. (1994) contrasted the effects of phonologic versus semantic, self-generated cues on subjects' ability to provide the target word for each symbol presented. Pre- and post-training labeling probes revealed significantly better performance under the self-cueing condition. Marshall (1992) contrasted the efficacy of several cueing and facilitation techniques and found that self-cueing was the only condition that resulted in significant maintenance of increased naming at one week post-training. In a recent study by Kaipa & Thomas (2011), it was found that phonological cueing resulted in better lexical access and word retrieval abilities compared to semantic cueing strategies. Thus there have been equivocal studies documenting the benefits of phonological vs. semantic cueing strategies.

### **The cueing hierarchy: Increasing and Decreasing**

Based on group study results, cueing techniques can be ordered hierarchically according to their postulated effectiveness in assisting immediate lexical access (e.g., Danz & Lauer, 1997; Shewan & Bandur, 1994). In therapeutic applications, cueing hierarchies are frequently used in phonological word form facilitation, while semantic cueing hierarchies are rarely reported (e.g., Abel, 2001; Wambaugh, 2003; Wambaugh et al., 2001). All applications of cueing hierarchies encompass a notion of cue fading and aim at correct behaviour without any help. Each hierarchy of cueing consists of a minimum of two levels: Increasing cue strategies and decreasing cue strategies (Abel, Shulz, Radermacher, Willmes, & Huber, 2005). To treat word finding problems, increasing prompts have been frequently applied, with the exception of Wambaugh et al. (2001; Wambaugh, 2003) and Hillis and Caramazza (1994) who used both formats in a mixed version without considering possible effects of increasing and decreasing assistance. Riley and Heaton (2000) describe and compare the two methods with respect to their advantages and disadvantages in the rehabilitation of amnesic patients. With increasing cue hierarchy, all trials have the same format: The therapist first delivers an unspecified instruction and the patient has the opportunity

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to give a correct response without any help. Depending on the patient's response, prompts are delivered from the weakest to the strongest until a correct response becomes possible or until the controlling prompt has to be given. With decreasing assistance, the hierarchy is applied the other way round and trials differ from each other. Vanishing cues have proven to be an effective means of acquiring unknown domain-specific knowledge (Thone & von Cramon, 1999). There have been very limited studies which have investigated the increasing cue vs. decreasing cue hierarchies in treatment of word finding difficulties in Indian context, studies of this nature is very important to generate evidence based practice especially in countries like India which comprises a large clientele with aphasia. Thus, the aim of the current study was to compare the efficacy of increasing versus decreasing cues in improving the naming abilities of a Malayalam speaking individual with aphasia. A bi-directional research hypothesis was proposed wherein there would be a change in the naming abilities of our participant following the treatment (cueing) procedure.

## **Method**

This was a single case exploratory research design. Our participant was a 79 year old female who met the following criteria: (a) right handed, (b) native speaker of Malayalam, and (c) had 15-18 years of education. She was seen by the first author six months post-onset of a left hemisphere cerebrovascular incident. She demonstrated language deficits consistent with the diagnosis of aphasia as shown by the performance on the adapted versions of Western Aphasic Battery and Boston Naming Test. The participant was referred to the first author for speech and language therapy. Initial assessments revealed that her naming abilities were significantly affected, following which a systematic therapy protocol was charted out. The study was conducted in three phases (Figure 1).

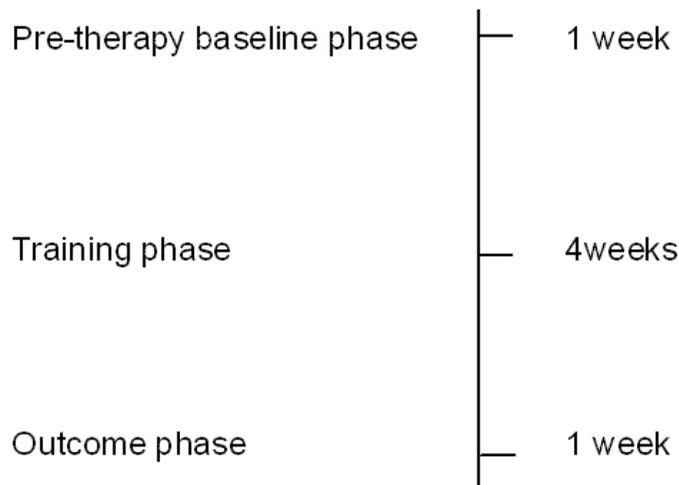
Figure 1: Time line for the study

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Phase 1 served as the baseline phase of the patient’s baseline naming ability. Phase 2 was the training phase wherein the patient’s naming abilities was facilitated using increasing and decreasing cues. Finally, the phase 3 served as the outcome phase during which the efficacy of increasing vs. decreasing cues was compared. The data collection protocol followed a design similar to a study by Abel, Schultz, Radermacher, Willmes and Huber (2005).

**Phase I: Experimental stimuli and baseline data collection**

The experimental stimuli consisted of 200 colour photographs of objects selected from Western Aphasia Battery and Boston Naming test. To select the stimuli for training, the participant was asked to name all the 200 items during two sessions spaced over 2 days. From the stimuli, 80 were taken randomly as the experimental stimuli and these were made use in the therapy with increasing and decreasing cues. These two pre training sessions served as the baseline data points for the study and it was carried out in a span of one week.

**Phase II: Training**

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The study used a single-subject, alternating treatment design to compare the effect of two cueing procedures. The experimental conditions were administered concurrently, and the order of the training sessions was semi-randomized to avoid order effects. The training sessions were conducted once a day, approximately two-three times a week until a total of 12 sessions. Training altogether consisted of six sessions with increasing cues and six sessions with decreasing cues in a semi-randomized fashion. During each training session, all target words were presented twice. Among the 80 nominal categories, 40 nouns were used for probing effect of increasing cues and 40 other nouns were used for probing effect of decreasing cues. Cueing was carried out in a decreasing hierarchy and increasing hierarchy which is shown in Tables 1 & 2 respectively.

Table 1: Protocol for decreasing cue therapy

SCORE	CUE	EXAMPLE
6	Repetition	That's a plant. That's a.....
5	First syllable	That's a /pla/....
4	First sound	That's a /p/....
3	Closure sentence	In my garden there is a .....
2	Definition	That's green and has leaves.....
1	Naming	That's a .....

### Training Procedure

Within a session, the treatment consisted of either increasing cues or decreasing cues. The cueing hierarchy was the same but applied in a different direction for the decreasing method (hierarchy level 1-6) and the increasing method (hierarchy level 6-1). All cues were spoken and embedded in the carrier phrase "That's a . . .". The cueing levels were graduated from the strongest prompt with the largest amount of information about the target (level 1) to the weakest prompt with the

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least information (level 6). At the first level, control prompts were given, i.e., the target word was fully spoken by the therapist in order to provide a linguistic model and to ensure as much as possible a patient's correct lexical access. The patient was asked to repeat the target word, which was iterated twice to allow at least an approximation to the correct performance. Level 2 contained the first syllable or in the case of one-syllable words, all sounds up to the nucleus, and level 3 merely the first sound of the word. At level 4 the carrier sentence was substituted by a semantic closure sentence and at level 5 preceded by a definition. Thus levels 4 and 5 provided semantic information about the target word as opposed to phonological information at levels 1-3. Finally, at level 6 the carrier phrase was used alone, thereby stimulating in a phonologically and semantically unspecified way (target stimulus). The first author recorded success or failure for each response on a worksheet.

Application of the increasing method was as follows (see Table 2):

SCORE	CUE	EXAMPLE
6	Naming	That's a .....
5	Definition	That's green and has leaves.....
4	Closure sentence	In my garden there is a .....
3	First sound	That's a /p/.....
2	First syllable	That's a /pla/.....
1	Repetition	That's a plant. That's a.....

A picture was presented and the patient was just asked to name the object (level 6). The patient had about 5 seconds for a correct response. If the patient was able to respond correctly the next picture was shown. Otherwise, the therapist delivered the next prompt, description of definition (level 5) and waited for 5 seconds. The prompts on the next levels (levels 4±2) were given in the same way. If all semantic and phonological cues failed, the target word was given for repetition. There were five trials a session on which the patient was stimulated. In the decreasing cue

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condition the cues were faded by applying the hierarchy in decreasing order going from strongest to least assistance.

### **Scoring**

A score of 0 was given for incorrect responses and 1 for correct responses. Responses were rated incorrect if they consisted of no reaction, perseverations, semantic errors, and circumlocutions, and if more than one third of the phonemes of a target word were changed. A verbal reaction was scored correct if it was the target word, a close semantic coordinate (e.g., ``alligator" for ``crocodile"), if less than one third of the phonemes of the target word were changed, if a morphological variant was produced (e.g., a plural form) or if the correct word was concatenated with an adjective or a verb (e.g., ``dan-gerous crocodile", ``sleeping bed")

### **Phase III: Outcome phase**

The third phase evaluated the outcomes of the two forms of treatment. During this phase, 100 separate nominal categories were presented to the patient through the two forms of cueing alternatively in a random manner (50 were presented through increased cueing and the rest 50 through decreased cueing). The correct responses generated by the patient were scored by the first author. The same scoring method as used in the training phase was used in the outcome phase also. The outcome phase basically compared the efficacy of two cueing procedures in improving naming abilities after the training procedure. Differences between the two forms of treatment was analysed through t tests and follow up tests were performed to find out any significant differences.

### **Statistical Analysis**

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This study employed a repeated measure research design. Thus the data was analyzed through a repeated measure 't' test. As a bi-directional hypothesis was proposed in the current study, a two tailed 't' test was used for the purpose of data analysis.

## **Results**

The results during the training phase revealed that our participant exhibited better naming skills through the increased cueing hierarchy compared to the decreased cueing hierarchy. The mean correct score for increased cueing hierarchy during the training phase was 4.6 and for the decreased cueing hierarchy it was 3.3. The outcome phase also revealed similar trend with better performance through increased cueing compared to the decreased cueing. The mean correct score for increased cueing hierarchy was 3.9 and for the decreased cueing hierarchy, the mean correct score was 2.26. The repeated measure two tailed 't' test was significant [ $t(29)=5.35$ ,  $p<0.01$ ]. Thus, the results revealed that the mean correct score achieved through the increasing cueing hierarchy was significantly higher than the mean correct score obtained through the decreasing cueing hierarchy.

## **Discussion**

Choosing the procedure that will be most effective for facilitating naming is critical in the management program. Restoration of naming abilities is an important part of the language treatment protocol in individuals with anomia. The two well known cueing procedures to treat naming difficulties in individuals with anomia are phonemic cueing and semantic cueing. There has been a wealth of literature investigating the efficacy of phonemic vs. semantic cueing. However, what remains unknown is the hierarchical order at which these cues should be provided. The current study aimed at investigating the effects of increasing and decreasing cueing in an individual with significant naming deficits. The results of the current study favour an increased cueing hierarchy to treat naming difficulties. The research in the area of skill

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learning reveals that in order to facilitate the learning of a new skill, increased augmented (external) cueing and feedback helps the person to acquire the new skill (Schmidt & Weisberg, 2000). Similarly, in the present study also the increased augmented cueing might have helped our participant to overcome the naming deficits to certain extent.

The increasing cue method encourages the patient to use semantic information about the target word to produce the correct response because the first two cues delivered after the patient fails to produce the word spontaneously are definition and semantic closure sentences. On the other hand, the decreasing cue method first provides word form information (full word form, first syllable, and first sound). Therefore, semantic cue levels may not always be reached and, even if reached, active semantic processing may not be needed to further perform the task. Hence, the first author always asked the patient to pay full attention to the semantic cues, and left enough time before the deliverance of the next cue in the decreasing direction to ensure that the patient did not just repeat the word form from working memory. Patients with a semantic deficit might be better addressed by increasing assistance, while patients with phonological lesions might respond better to decreasing cues. Our participant might have had a problem in retrieving semantic lexical information and therefore might have benefitted from increasing cue therapy. The results of the current study should be exercised with caution as it employed an alternating treatment research design. An ideal way to establish the findings of the current study would be to recruit larger number of participants and involving them in control trial studies comparing the efficacy of both the cueing procedures.

## **Conclusion**

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The data obtained in the present investigation suggests that increased cueing hierarchy facilitated correct naming responses in comparison to decreased cueing hierarchy. These results need to be interpreted with caution as this was a single case design. Further studies need to be carried out to vouch these obtained results. The retention of the naming abilities achieved through the increased cueing remains to be explored and it is beyond the scope of the current study.

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### **References**

Abel, S. (2001). Lexikalische Stoerungen bei Aphasie: Ein Einzelfall im konnektionistischen Modell von G.S. Dell. M.A thesis, Aachen University of Technology (RWTH).

Abel, S., Schultz, A., Radermacher, I., Willmes, K. and Huber, W. (2005). Decreasing and increasing cues in naming therapy for aphasia. *Aphasiology*, 19(9), 831–848.

Danz, U., & Lauer, N. (1997). Systematischer Einsatz von Hilfen in der Aphasietherapie. *Forum Logopadie*, 5, 9-13.

Hillis, A. E., & Caramazza, A. (1994). Theories of lexical processing and rehabilitation of lexical deficits. In M. J. Riddoch & G.W. Humphreys (Eds.), *Cognitive neuropsychology and cognitive rehabilitation* (pp. 449- 484). Hove, UK: Lawrence Erlbaum Associates Ltd.

Howard, D. (2009). Cognitive neuropsychology and aphasia therapy: The case of word retrieval. In I. Papa- thanasiou (Ed.), *Acquired neurogenic communication disorders: A clinical perspective*. London: Whurr.

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Howard, D., Patterson, K. E., Franklin, S., Orchard-Lisle, V., & Morton, J. (1985a). The facilitation of picture naming. *Cognitive Neuropsychology*, 2, 49-80.

Kaipa, R., & Thomas, R. M. (2011). The effects of semantic and phonemic cue therapy on improving naming abilities in a Malayalam speaking person with aphasia. Paper presented at the 8<sup>th</sup> Asia Pacific Conference on Speech, Language & Hearing, University of Canterbury, Christchurch, January 11<sup>th</sup> -14<sup>th</sup>.

Levelt, W. J. M., Schriefers, H., Vorberg D., Meyer, A. S., Pechmann, T., Havinga, J. (1991). The Time Course of Lexical Access in Speech Production: A Study of Picture Naming. *Psychological Review* , 98, 122-142.

Li, E. C., & Williams, S. E. (1989). The efficacy of two types of cues in aphasic patients. *Aphasiology*, 3, 619- 626

Marshall, R. C. (1992). Problem-focused group treatment for clients with mild aphasia. *American Journal of Speech-Language Pathology*, 2, 31-37.

Marshall, R. C., & Rayner, H. (1994) Training volunteers as conversation partners for people with aphasia. *International Journal of Language & Communication Disorders*, 38, 149-164.

Riley, G. A., & Heaton, S. (2000). Guidelines for the selection of a method of fading cues. *Neuropsychological Rehabilitation*, 10, 133-149.

Saito, J. & Takeda, D. (2001). Phonological therapy for word-finding difficulties: A re-evaluation. *Aphasiology*, 16, 981-999.

Schmidt, R. A., & Wrisberg, C. A. (2000). *Motor Learning and Performance: A Situation Based Learning Approach*. Illinois: Human Kinetics.

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Shewan, C. M., & Bandur, D. L. (1994). Language-oriented treatment: A psycholinguistic approach to aphasia. In R. Chapey (Ed.), *Language intervention strategies in adult aphasia* (pp. 184-206). Baltimore: Williams & Wilkins.

Thone, A., & von Cramon, D. Y. (1999). Gedachtnisstörungen. In P. Frommelt & H. Groetzbach (Eds.), *Neuro- Rehabilitation. Grundlagen-Praxis-Dokumentation* (pp. 660-680). Berlin: Blackwell Wissenschafts- Verlag.

Wambaugh, J. L. (2003). A comparison of the relative effects of phonologic and semantic cueing treatment. *Aphasiology*, 17, 433-441.

Wambaugh, J. L., Linebaugh, C. W., Doyle, P. J., Martinez, A. L., Kalinyak-Fliszar, M., & Spencer, K. A. (2001). Effects of two cueing treatments on lexical retrieval in aphasic speakers with different levels of deficit. *Aphasiology*, 15, 933-950.

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