Evaluating the Effectiveness of Semantic-Based Treatment for Naming Deficits in Aphasia: What Works?

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ABSTRACT

This article reviews the basic principles and evidence for the effectiveness of a semantic-based treatment for naming deficits in aphasia. This article focuses on three aspects of semantic-based treatment. First, the theoretical basis for semantic treatment approaches to alleviate naming deficits is explained. Second, the different types of semantic treatment approaches (i.e., substitutive and restitutive treatments) are reviewed. More attention is provided to restitutive treatment approaches, and some ideas regarding why these treatments may be effective are discussed. We argue that strengthening access to impaired semantic and phonologic representations and facilitating generalization to untrained but related targets are two factors determining the success of a restitutive-based semantic treatment. Finally, in the third section of the article, the effect of semantic treatment on the overall communicative effectiveness and suggestions for future research in this field are discussed.

KEYWORDS: Semantic treatment, aphasia, generalization, typicality

Learning Outcomes: As a result of this activity, the reader will be able to describe typicality-based approaches to the treatment of aphasia.

The term *aphasia* is used to characterize language impairment resulting from neurologic injury to the brain. Different language deficits present depending on the type and severity of aphasia. Naming deficits are common to all aphasia types.[1] The degree of an individual's impairment in naming as well as the type of errors produced is often different for each individual. Many types of therapy for treatment of naming disorders exist, including behavioral approaches, therapy to reactivate lexical semantic or phonologic representations, use of

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alternate cognitive systems, and treatment focused on compensatory strategies. The purpose of this review is to focus on semantic treatment approaches for individuals with naming deficits and is broadly organized into three sections. First, the theoretical basis for semantic treatment approaches to alleviate naming deficits is explained. Second, the different types of semantic treatment approaches are reviewed, and some ideas regarding why these treatments may be effective are discussed. Finally, in the third section of the article, unanswered questions regarding the effect of semantic treatment on the overall communicative effectiveness and suggestions for future research in this field are discussed.

THEORETICAL BASIS OF NAMING DEFICITS

The nature and cause of naming deficits in individuals with aphasia can be explained by most current theoretical models of naming.[2,3] These models, in general, agree that lexical access involves activation of semantic and phonologic processes. However, they fall along a continuum when addressing details pertaining to the relative timing of lexical access. One view of naming proposes two sequential components to lexical access: lexical selection followed by phonologic encoding.[2,4–7] A different view of naming assumes that lexical access can have two levels but not necessarily two stages.[8,9] That is, activation of a word during naming involves two closely interacting levels: activation of the semantic representation and activation of the phonologic form of the target word.

Naming deficits in aphasia can arise either from incorrect/incomplete activation of semantic or phonologic information.[10–13] Individuals who have predominately phonologic errors also appear to have a deficit in the phonologic representation and often have concurrent deficits in real and nonword repetition.[14,15] Patients who demonstrate predominately semantic errors devoid of coexisting semantic impairments may have impairments in accessing phonologic representations from semantic representations.[14,16] Alternatively, the presence of semantic errors may also suggest impairment at the semantic level.[17,18]

Theoretical models have been beneficial both in pinpointing the source of naming deficits in individual patients as well as in providing some guidance in developing treatments for individuals with naming impairments.[19–22] In general, word retrieval treatments can be separated into two main methodologies: restitutive and substitutive.[23]

TREATMENT APPROACHES: SUBSTITUTIVE TREATMENT

The basic idea of substitutive strategies is to engage other intact subsystems (e.g., right hemisphere) to compensate for the deficits in language processing in the left hemisphere; for instance, compensatory treatment emphasizing that alternate means of communication (e.g., nonverbal) may be used in place of defective naming.

An example of a semantically driven substitutive treatment is the use of gesture to replace impaired verbal communication abilities. A recent review[24] examined 18 treatment studies employing gesture as a compensatory mechanism and found evidence supporting the claim that patients with moderate to severe aphasia could benefit from learning new gestures to improve their communicative abilities. Luria[25] referred to the substitutive therapy using gestures as "intersystemic gestural reorganization," which uses the intact gestural capabilities in a subject to activate language areas. Although substitutive treatments are beneficial in that they can improve overall communication abilities, the influence of treatment to facilitate generalization to more natural settings is inconclusive.

TREATMENT APPROACHES: RESTITUTIVE TREATMENT

In contrast, restitutive treatments are designed to enrich an individual's linguistic environment to reactivate or relearn aspects of language. Rothi[23] suggested that use of restitutive strategies encourages redevelopment relative to functioning and is most beneficial during the early stages when the neurophysiologic processes of recovery are at greatest potential. For the purposes of this review, only semantic restitutive treatments will be discussed, and thus studies that are focused on improving naming but involve phonologic cueing and/or orthographic cueing are not included. Thus, excluded in this review are treatment approaches that have addressed the issue of relative timing of stimulus presentation during treatment (i.e., spaced retrieval,[26] contextual priming[27]).

The fundamental assumption of restitutive therapy is that treatment focuses on relearning aspects of language that are deemed to be impaired. Consequently, restitutive treatment likely engages the damaged brain in functional reorganization to reestablish language skills (i.e., naming) that were previously lost. The scientific basis for this approach comes from several studies examining brain plasticity in animal models involving rats and monkeys.[28–31] For example, rehabilitative training of hand motor skill in primates after an induced injury to the primary motor cortex resulted in an improvement in their representational plasticity; specifically, regions surrounding and contralateral to the lesion were recruited to subserve function.[28–33] Further, Plautz and colleagues[31] found that the effects of an ischemic infarct that results in the destruction of the cortical hand representation in one hemisphere can be reversed by rehabilitative training and cortical stimulation. Interestingly, although the monkeys improved in speed and accuracy on motor tasks by the impaired limb, these changes were associated with a reemergence of hand representations in regions around the damaged cortex. These principles have been applied to the recovery of human motor function as well by Taub and colleagues who have found that forcing the use of the impaired limb by constraining the use of the nondamaged limb results in cortical reorganization through increases in the area of cortex involved in controlling the impaired limb.[34]

A second assumption of a restitutive therapy focused on reactivation of impaired language abilities is that generalization of training- induced improvements should occur to related but untrained stimuli and/or tasks. This is because mechanisms underlying treatment-induced success at a particular language skill should also be engaged in related tasks and for related stimuli. In other words, if a treatment approach is to have relevance beyond the specific training stimuli/tasks, generalization to untrained but related tasks/ stimuli must be a natural consequence of the treatment outcome.

Lexical-Semantic Approaches

In general, restitutive treatments for improving semantic processing have included tasks such as brought about by auditory-word to picture matching, written-word to picture matching, answering of yes/no questions, picture and spoken word categorization, and judging relatedness to a target word given a set of pictures.[35–38] The goal of these tasks is to strengthen semantic activation of specific targets to facilitate word retrieval of the specific targets. The tasks are assumed to be semantic in nature; however, the phonologic representation of the target words is also provided in many of the tasks. Therefore, improvement documented in their results may be due to a combination of semantic and phonologic cues presented in treatment. This observation is consistent with the predictions of those theoretical models of lexical access that imply a semantic/phonologic treatment will strengthen semantic and phonologic representations at the semantic and phonologic levels, respectively.

For example, Marshall et al[37] described an experiment in which participants were chosen on the basis of their superior ability to read aloud picture names. The treatment tasks included reading aloud four words before selecting one as the appropriate name for a picture. The written words comprised the target, two semantically related words (one of which was also present in the naming set), and an unrelated word (also present in the naming set). Because a combination of semantic and phonologic processing was employed, it was hypothesized that the task would reinforce links between semantics activated by the matching tasks and phonology activated at the level of the output lexicon from reading aloud. Posttherapy testing revealed a significant improvement for treated items and for semantically related foils although unrelated foils and items not seen during therapy did not improve significantly.

Davis and Pring[39] attempted to address the issue of which aspect of the semantic treatment, if any, assisted in naming. One of their training tasks was similar to the task used by Marshall et al; patients matched a picture to one of four semantically related written words, which they read aloud or repeated. The second task was similar except that the distracter words were unrelated to the picture. The third task involved repetition of the word in the presence of the target picture alone. Davis and Pring argued that if a semantic element is central to improvement, then the first two tasks will be more effective than the third, and because the first task engages more detailed semantic processing (i.e., selecting a target word from semantic distracters), the first task should be more effective than the second. Davis and Pring also argued that if therapy were effective by virtue of repeated exposure of pictures and repetition of their names, no difference would be expected between the three conditions. Davis and Pring reported a significant improvement in terms of the mean change of treatment items in all treatment conditions and for unrelated foils, but surprisingly not for related foils. There was also no change in the control items that were not seen during therapy. Therefore, although generalization occurred, it appeared to occur for unrelated foils.[39]

Another study that has found improvement of trained items while failing to observe generalization for untrained items is by Pring and colleagues.[40] Stimuli in this study were divided into treated items, related items seen during treatment, related items not seen during treatment, and control items. Two tasks were used during treatment, the first involving word-to-picture matching, where, for instance, the picture of a can opener appeared with the words “can opener,” “corkscrew,” “spoon,” and “nutcracker,” and participants were required to match the accurate word with the picture. The second task involved picture-to-word matching, where for example, the written names “mug,” “bowl,” and “glass” appeared with their own pictures and with pictures of a cup, a saucer, and an egg timer. In each treatment session, the targets and distracters were shown two to four times. Five aphasic patients with word-finding difficulty, as measured by a series of tests prior to initiation of treatment, were involved in the experiment. Results indicated significant improvement of treated items as well as related items that were seen during treatment, when tested immediately after treatment and 1 month after treatment. However, related items not seen during treatment did not demonstrate any improvement. The authors, therefore, suggested that generalization does not occur across the whole category of items used in therapy, but rather that its occurrence seems to require also that familiarity with an item be built up by the repeated appearance of its name or picture during therapy.[40]

A related approach, termed *semantic distinction treatment*, is used when it is determined that access to specific semantic representations is impaired because of competition from related semantic distractors.[41] Hillis used a training protocol that provided the patient with semantic information about target features for words that the individual could not name and contrasted those semantic features with an object closely related to the target. Patients demonstrated improvements in naming of trained items and generalized to untrained items and untrained lexical tasks.

Semantic Relationships and Contextual Approaches

Visch-Brink et al[42] described a semantic treatment for mild-moderate aphasic patients presenting with naming difficulties. The treatment is focused on written stimuli; therefore, patients involved in this treatment should demonstrate relatively normal written comprehension abilities. The treatment centered around eight semantic relationships in Dutch: semantic categories, syntagmatic and paradigmatic relations (i.e., relationship between words that define the selection of words that constitute a sentence and those that can substitute other words similar in meaning), semantic gradation, adjectives and exclamations, part-whole relationships, anomalous sentences, semantic definition, and semantic context. During treatment, patients practiced the relationships described above that were organized as specific tasks and divided into sublevels of difficulty. In all tasks, participants were required to select a written response (either nouns or adjectives) from distracters. Visch-Brink et al reported data from two patients who demonstrated improvement on production on nouns after treatment and improvement on standardized measures of language. However, this treatment did not appear to be valuable for all aphasic patients, and the data from Visch-Brink et al are yet to be replicated in other patients or in other languages.

In a recent study, Herbert and colleagues examined the effectiveness of a combination of orthographic cueing and conversational context to improve naming in six aphasic patients with naming deficits.[43] Trained and untrained stimuli were classified into conversational contexts such as shopping, family, and household items, and therapy tasks included category generation of categorized lists. Although this experiment did not specifically train semantic information, the nature of therapy tasks likely engaged in semantic retrieval akin to the studies discussed here. Results of this study revealed improved retrieval of target words during conversational tasks and picture naming.

Semantic Feature Analysis Approaches

Another semantic restitutive strategy is semantic feature matrix training.[44] In one example of this treatment approach, participants were trained on the properties of objects using a matrix of printed cue words (e.g., function, physical properties, superordinate category, etc.) concerning a target picture to retrieve semantic information about a picture as well as its lexical form. A similar treatment focused on improving semantic representation is semantic feature analysis training proposed by Boyle and colleagues.[45,46] In this treatment, participants were required to self-generate feature information about the target words. Each target was placed in the center of a chart, and participants were required to generate some relevant semantic features that included group (e.g., belongs to this category), use (e.g., use it for), action (e.g., what does it do), property (e.g., describe it as), location (e.g., find it here), and association (e.g., reminds me of). Results indicated that participants improved in naming and generalization to untrained items.

In a subsequent study, Boyle[46] examined the effect of semantic feature analysis in two individuals with chronic fluent aphasia. In addition to confrontation naming of trained and untrained items, the effect of treatment on discourse production was also investigated. Results revealed improved confrontation naming of trained items and generalization to naming of untrained items to items within and across semantic categories. No differences were observed between training a few exemplars versus training many exemplars in one of the two participants. Also, both participants showed some changes on discourse production as a function of treatment. Specifically, participant 1 improved in his ability to efficiently convey accurate information (measured as the number of CIUs produced per minute) that was associated with a decrease in the number of instances lexical retrieval was delayed (measured by T-units that contained delays). In contrast, participant 2 showed an increase in the number of CIUs produced at the end of treatment suggesting an overall increase in the amount of accurate information conveyed, but the efficiency and time required for lexical access remained unchanged.

There are also treatment studies that have examined the influence on semantic treatment on access to lexical items within a specific category. For instance, Drew and Thompson[47] conducted a semantic-based treatment used to train naming of nouns in two semantic categories in four patients with severe naming deficits with concurrent semantic impairments. The authors performed a series of tasks to strengthen the associations in the network of structural and semantic levels of processing to improve participants' picture naming. Drew and Thompson suggested that strengthening the associations through the use of categorical tasks, responding to yes/no questions, either/or questions, and matching a spoken definition to picture tasks would improve the functioning of the structural and semantic levels while also improving access to the phonology of words. Drew and Thompson found that two out of four participants improved in naming after receiving semantic treatment, whereas the other two participants improved only after receiving treatment that emphasized the phonologic form of the word. These findings support previous semantic treatment studies indicating that semantic and phonologic treatment together may be most efficacious for participants.

Typicality Treatment Approach

As another approach, the differential representation of atypical and typical examples within a semantic category has been exploited in a novel treatment of naming deficits in patients with aphasia.[48–50] Evidence that typicality determines category exemplar access stems from Rosch's[51] seminal work showing that atypical exemplars (e.g., *ostrich*) have a different status within a semantic category (e.g., *bird*) than typical examples that exemplify the central tendency of the category (e.g., *robin*). For example, healthy control subjects are typically faster to assign the basic-level name DOG when the stimulus is a prototypical dog (e.g., Labrador retriever) relative to an atypical category member (e.g., Basenji). This advantage is referred to as a *typicality effect*. The fundamental assumption of typicality-based treatment is that strengthening access to semantic attributes results in facilitation of target semantic nodes at the semantic level, which further facilitates access to phonologic representations, thereby strengthening phonologic nodes as well. Also, enhanced access to target semantic representations facilitates semantically related neighbors. This, in turn, results in facilitation of corresponding phonologic representations (Fig. 1). The treatment also assumes that training atypical items facilitates greater generalization to untrained items

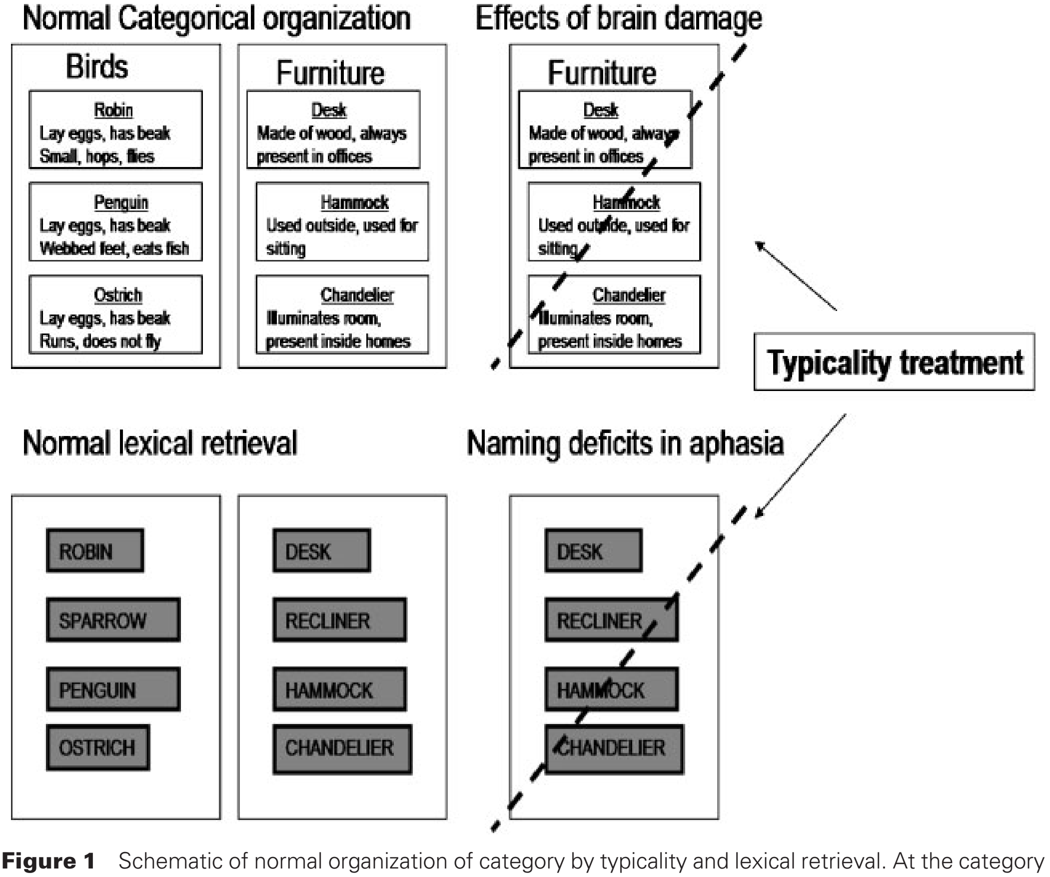

Figure 1 Schematic of normal organization of category by typicality and lexical retrieval. At the category level, specific examples are represented by their semantic attributes. At the lexical retrieval level, specific examples are represented by their phonologic representations. Aphasia can result from impairment at either or both levels of representation. It hypothesized that the typicality treatment targets both semantic and phonologic representations.

Table 1 Summary of Response to Treatment of Typical or Atypical Examples across the Four Treatment Studies

Participant	Pre-tx WAB AQ	Age (years)	Category Trained	Generalization Trends
Animate categories (Kiran and Thompson[48])				
P1	43.4	64	1. Birds	Typical ≠ > Atypical
			2. Vegetables	Atypical = > Typical
P2	50.9	63	1. Birds	Atypical = > Typical
			2. Vegetables	Atypical = > Typical
P3	70	72	1. Vegetables	Typical ≠ > Atypical
P4	46.4	75	1. Vegetables	Atypical = > Typical
			2. Birds	Atypical = > Typical
Inanimate categories (Kiran[50])				
P1	56.7	55	1. Clothing	Atypical = > Typical
			2. Furniture	Typical ≠ > Atypical
P2	72.5	77	1. Furniture	Typical ≠ > Atypical
P3	62.2	57	1. Furniture	Atypical ≠ > Typical
			2. Clothing	Typical ≠ > Atypical
P4	46.4	53	1. Clothing	Typical ≠ > Atypical
			2. Furniture	Atypical = > Typical
P5	37	51	1. Furniture	Atypical = > Typical
Well-defined categories (Kiran and Johnson[49])				
P1	82.5	53	1. Shapes	Atypical = > Typical
P2	84.3	75	1. Shapes	Typical ≠ > Atypical
P3	87.3	57	1. Shapes	Atypical = > Typical
Ad hoc categories (Kiran, Bassetto, and Sebastian, in preparation)				
P1	79	76	1. Things at garage sale	Atypical = > Typical
P2	82	39	1. Things to take camping	Atypical = > Typical
			2. Things at garage sale	Typical = > Atypical
P3	84.3	76	1. Things at garage sale	Atypical = > Typical
P4	72.1	69	1. Things to take camping	Typical ≠ > Atypical
			2. Things at garage sale	Atypical = > Typical
				Weak generalization
P5	70.9	84	1. Things to take camping	Typical ≠ > Atypical

Pre-tx, pretreatment; WAB AQ, Western Aphasia Battery Aphasia Quotient. ≠ > indicates does not improve; = > indicates improves.

compared with training typical category exemplars[48] because atypical examples represent a greater variation of semantic attributes within the category compared with typical examples.[52] In each of these studies, the effect of treatment was examined using a single-subject experimental design. Participants were provided with semantic feature treatment comprising semantic feature manipulations, yes/no questions, and category sorting. Treatment was provided to a set of trained typical or atypical examples, and generalization was examined to the untrained examples within the category. The order of typicality was counterbalanced across participants in each study (see Table 1 for summary of treatment results).

In the first study, Kiran and Thompson[48] sought to determine the effect of typicality of animate category exemplars within the categories of birds and vegetables in aphasic patients with anomia. The authors found that patients who were trained on naming of atypical exemplars demonstrated generalization to naming of immediate and typical items, whereas individuals given therapy with typical exemplars did not generalize to atypical items.

In the second study, the effect of typicality was examined in the context of two inanimate categories (e.g., clothing, furniture). Results from five participants involved in treatment for inanimate categories showed that participants trained on atypical items demonstrated significant generalization to untrained items in a category with the exception of one of the five participants.[50] In contrast, training typical examples did not result in generalization to untrained atypical examples within a category. Likewise, three participants were involved in a typicality treatment examining well-defined categories. Well-defined categories (e.g., *shapes, odd numbers)* have fairly rigid category boundaries and an all-or-none membership of corresponding category exemplars. Therefore, in such categories, typicality effects may not be as robust as in animate or inanimate categories. Despite this, results revealed that two of the three participants trained with atypical items improved in both trained and untrained naming of typical items in the category, whereas training typical examples did not improve access to atypical examples.[49]

Another study examined the nature and graded representation of goal-derived categories (e.g., things to take camping, things at the garage sale). These categories are also called ad hoc categories because they do not have rigidly defined features that constitute category membership. Instead, category members follow a loosely combined thread of common features. Even though ad hoc categories are not as established in memory as common categories because people have had less experience of them as categorical concepts, ad hoc categories are instrumental to achieving goals, particularly goals of daily living.[53] Five participants with fluent aphasia and naming deficits received semantic feature treatment to improve category generation for either typical or atypical examples within goal-derived ad hoc categories (S. Kiran, unpublished data). Once again, results revealed that training atypical examples in the category resulted in generalization to untrained typical examples with strong changes in all four patients who were trained on atypical examples. Training typical examples did not result in generalization to untrained atypical examples in two of the three patients trained on typical examples.

In summary, most semantic treatments aimed at facilitating access to lexical items are generally successful in improving trained items and to a certain extent are successful in improving untrained items as well. Although the nature of the tasks is varied across the different studies, in general, they appear to address a common goal of stimulating impaired semantic and phonologic representations to improve naming abilities.

WHY DOES RESTITUTIVE TREATMENT WORK?

At this juncture, it is worthwhile to outline some hypotheses for why some restitutive treatments appear to be more effective than others. First, it should be noted that all the studies have been successful at improving naming to items that are directly targeted in treatment. At debate is the effectiveness of treatment in improving access to untrained items (i.e., generalization). One possible explanation for the discrepancy in generalization patterns is the extent to which the semantic treatment requires explicit processing of semantic information relevant to target items (e.g., rose: flower, colorful, red, smell*s*). From a theoretical standpoint, activation of a target word inherently engages activation of the target's semantic attributes[3,13] as well as creates a spreading of activation to related semantic neighbors.[54] Therefore, a treatment that overtly and repeatedly consolidates activation of target semantic attributes as well as activation of related (but untrained) neighbors has a higher likelihood of promoting generalization to untrained items.

As an example, Boyle and Coehlo[45] showed generalization to untrained items in their semantic feature analysis treatment approach. In this treatment, participants were trained through the use of specific semantic information concerning a pictured object such as category membership, function, physical properties, location, and so forth. Repeated exposure to the semantic features likely strengthened the connection between the semantic system and the targeted lexical item resulting in improved naming of trained and untrained words. Similarly, Kiran and

Thompson[48] selected a diverse set of semantic features that encompassed information relevant to both typical and atypical examples in the category. These carefully selected features were a central component of the typicality treatment, as the main difference between training typical examples and atypical examples lay in the variation of semantic features that the participant was exposed to during treatment. For instance, for each target example, participants were required to select six semantic attributes that were relevant for the target example. In this process, when participants were trained on atypical examples, they were required to accept some features relevant to typical examples and atypical examples. For example, for the target *ostrich*, participants were expected to select features such *as flies, lives in trees* (that are also relevant to typical examples), and *long legs* and *long neck* (that are not applicable to typical examples). In contrast, when participants were trained on typical examples such as *robin*, they were required to accept features that were only relevant to those examples (such as *flies, lives in trees*) but reject features such as *long legs, long neck* that are usually associated with atypical examples.

In contrast, studies that have failed to show to untrained items required participants to select target words or pictures from distracters[40] but did not discuss the nature of semantic relationships with respect to semantic attributes (e.g., an apple is a fruit that is red in color and is juicy and has a core). It is, therefore, argued that the extent to which a participant engages in focused semantic processing activities influences the outcome of the semantic treatment approach.[52]

FACTORS INFLUENCING TREATMENT OUTCOMES

In this final section, we comment on the need for empirical investigation of the broader impact of semantic-based naming treatment on overall communicative effectiveness in individuals with aphasia. Several researchers have performed meta-analyses of the outcomes from aphasia treatment studies.[55–57] For instance, Robey[56] conducted a meta-analysis using 21 aphasia-treatment studies and found that participants in the acute phase of recovery received almost twice the amount of benefit compared with the control group. The meta-analysis also found that effect sizes for treated and untreated comparisons indicated improvement for patients in both acute and chronic stages.

With specific regard to semantic treatment studies for naming deficits, studies reviewed in this paper have provided clinical outcome data that indicated the benefit of aphasia therapy. However, while the focus of most treatment studies has been the examination of the efficacy of different aphasia treatment approaches, two important questions remained unresolved. First, what factors influence the gains observed after therapy? Second, to what extent do changes in participants' standardized test scores reflect the overall improvement in language skills after therapy?

It is almost certain that improvements subsequent to treatment are likely influenced by patient and treatment specific factors. As an example, participant's age, duration of treatment, and initial language severity are all potential predictors of treatment-induced language recovery. The influence of age and language severity on aphasia recovery is not completely understood. In an early study, Kertesz and McCabe[58] found that age and rate of recovery were negatively correlated such that younger patients on average made higher gains than the older participants. They also found that higher-functioning participants at the start of the therapy (determined by participants' initial Western Aphasia Battery Aphasia Quotient[59]) were significantly more likely to have a better prognosis.

Likewise, the influence of intensity and duration of treatment are also likely factors that determine the extent of improvements subsequent to treatment. Hinckley and Carr[60] examined the influence of intensive training versus nonintensive training on several language outcome measures across two groups of patients with aphasia. The authors found that intensive context–based treatment was no more effective than nonintensive treatment when the outcome measures included improvements on trained items or untrained contexts. Further, intensive language treatment did not result in greater gains than nonintensive treatment on standardized language measures evaluating treatment outcome. In contrast, Bhogal et al found that intense aphasia therapy over a short period of time has greater impact on recovery than does less intense therapy over a longer period of time.[61] Basso[62] also concluded that the number of therapy sessions is an important factor in recovery. Basso also suggested that therapies provided for long periods of time may have favorable effects on the treated patients' communicative competence.

Another unresolved issue is the relationship between the extent of improvement on standardized tests of language and therapy gains reflected by a specific behavioral measure. Although one would logically expect this relationship to be positive (i.e., gains made in therapy would positively correlate with an individual's overall language skills), this finding may not consistently be the case. At the very least, it would be logical to assume that improvements in treatment should be accompanied by improvements on language tasks that are presumably similar to the treatment and therefore rely on similar processing mechanisms. For example, improvement in naming in treatment should likely be accompanied by improvements on the standardized measures of naming such as the Boston Naming Test.[63]

CONCLUSION

None of aforementioned issues has been systematically examined within the context of semantic-based treatments for naming deficits in aphasia. Further research is needed to provide clinicians with adequate evidence to make appropriate clinical decisions. Additional research using a large sample of participants with aphasia is needed to determine correlations between therapy gains and standardized tests of language. Ultimately, the goal of any experimental treatment is to allow its translation to a clinical setting and then to everyday use. Consequently, patients with aphasia will benefit from future research that indicates the importance of aphasia therapy and gives them realistic expectations concerning the gains made after receiving aphasia therapy.

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