

Defining Single Versus Dual Definition Idioms: The Performance  
of Right Hemisphere and Non-Brain-Damaged Adults

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It has become almost axiomatic that right hemisphere damaged (RH) patients tend to be literal and concrete. Research demonstrates impaired ability among some RH patients in 1) the appreciation of the implicit or intended meaning of pictured situations (Myers, 1979; Myers et al., 1985); and 2) the interpretation of visually and orally presented stories (Rivers and Love, 1980; Wapner et al., 1981; Myers and Linebaugh, 1981; and Gardner et al., 1983). These studies suggest that difficulties in moving beyond explicit or literal meaning may reflect a failure to appreciate and integrate contextual cues in verbal and pictorial stimuli. Other evidence suggests that RH damage also impairs the ability to appreciate connotative or implied meaning in verbal stimuli presented in isolation without contextual cues, whether in the form of single words (Gardner and Denes, 1973) or phrases like idiomatic expressions and proverbs (Winner and Gardner, 1977; Hier and Kaplan, 1980). These findings suggest that RH damage affects the ability to appreciate figurative language itself, regardless of context.

Recent work by Brownell et al. (1984a; 1984b) supports this notion indirectly. They investigated the sensitivity of brain damaged adults to the connotative versus denotative meaning of single words. Denotative meaning refers to a single, literal, dictionary-like definition in which the word "hawk," for example would be defined as a type of bird. Connotative meaning refers to alternate meanings that are less explicit and less literal. One connotative meaning of "hawk," for example, would be "predator." In their studies, Brownell et al. asked subjects to group two out of three words that were closest in meaning. Words could be grouped according to connotative or denotative meaning. They found that RH subjects relied on denotative meaning in clustering words, while left hemisphere (LH) subjects relied significantly more on connotative word meanings. These findings led the authors to suggest that "a normal individual's knowledge of word meanings is, in reality, a sum of separable lexical stores that are (1) mediated by different parts of the brain, and (2) devoted to different orders of semantic information" (1984, p.263). This possibility has significant implications for the diagnosis and treatment of RH and aphasic patients.

The present study was designed to explore that hypothesis in an idiom definition task. Two factors motivated the choice of task; (1) clinicians testing for RH communication deficits generally include an idiom definition task in their testing, and (2) such tasks often yield inconsistent results. It was hypothesized that inconsistent responses may be due in part to stimulus variability involving connotative versus denotative meanings. Although the accurate definition of an idiom is a figurative one, the number of possible definitions for an idiom varies, depending on whether the phrase can be translated word by word into a literal definition as well. Because of their wording, some idioms have only one possible meaning, a figurative one (i.e. "out of the question," "foul up," or "out of character"). Others can

have both a figurative and a literal interpretation (i.e. "hit below the belt," "blind date," or "rub elbows with"). Single-definition idioms can be considered to have only a denotative meaning since meaning and phrase would have been stored in a one-to-one relationship as a dictionary-like definition. It was hypothesized that if separable lexical stores do exist for linguistic meaning, with the LH predominant in appreciating denotative meaning and the RH dominant in connotative or alternate meanings, RH patients would have more difficulty defining dual-definition idioms than they would defining single-definition ones. That is, they would respond more accurately to idioms for which only one meaning had been stored.

The purpose of the present study was to determine if response variability in defining idioms was related to idiom type. It was hoped the results would shed light on the notion of hemispheric specialization for linguistic meaning, on the validity of using an idiom definition task in testing for communication impairments, and on whether or not RH patients tend to be "literal and concrete" in linguistic tasks that are not dependent on processing contextual cues.

#### METHOD

**Subjects.** Subjects included nine right-handed adults with unilateral RH damage. Lesion localization was obtained by CT scan and is shown in Table 1. None of these subjects had left-sided neglect as measured by line bisection and by a cancellation task (Albert, 1973). All were medically stable at the time of testing. They ranged in age from 39 to 75 years (mean = 61.4 yrs.) and in years of education from 7 to 20 (mean = 11.6 yrs.). They ranged from 1 month to 4.5 years post-onset (mean = 11.7 months). Control subjects were comparable in age and education to the RH group. They included nine right-handed adults with no history of neurological impairment. They ranged in age from 41 to 80 (mean = 69.2 yrs.) and in years of education from 12 to 18 (mean = 14.6).

Table 1. Subject characteristics.

SUBJECT #	TIME POST-ONSET	LOCALIZATION (CT)
1	8 months	temporal, posterior, frontal anterior parietal, basal ganglia, external and internal capsules
2	2 months	basal ganglia
3	57 months	head of the caudate nucleus, anterior limits of internal capsule, basal ganglionic area, extending into temporal lobe
4	17 months	temporo-occipital
5	7 months	parietal
6	1 month	fronto-parietal
7	7 months	"right intracerebral hemorrhage"
8	1 month	right thalamic region
9	5 months	temporo-parietal

Procedure. To develop the stimuli, a list of 50 idiomatic expressions was given to eight independent judges who were asked to classify each idiom according to whether it had a single (figurative) definition or a dual (figurative and literal) definition. Fifteen single-definition and 15 dual-definition idioms of which at least 6 of the 8 judges agreed were selected and randomly mixed into a final list of 30 idioms.

The idioms were presented to subjects with the instructions "What does the expression \_\_\_\_\_ mean?" Repetitions were given as needed. A pretest in which subjects were asked to define four additional idioms was used to familiarize subjects with the task and to exclude those who could not manage it. None of the subjects had to be eliminated. Responses were tape-recorded and transcribed.

Scoring. A correct response was operationally defined as follows:

"An accurate definition unequivocally demonstrates knowledge of the figurative meaning of the expression. To be accurate a definition need not be worded in abstract terms, but it must be complete. Supportive information must extend and not contradict the original definition unless a self-correction has been signalled."

An example of an accurate definition for the expression "out of the woods" is, "Things should go smoothly from now on. Could be you're out of danger." Responses were scored on a plus-minus basis by two independent judges. Percent agreement between the two judges was 94% for control group responses and 94.6% for experimental group responses.

A qualitative analysis of the error responses was also conducted. Error categories consisted of the following five types: approximate, incomplete, concrete, wrong, and don't know. Appendix A gives the operational definitions and a sample subject response for each error type. Two independent judges classified the errors from both subject groups with 94% agreement.

## RESULTS

The control subjects made 68 errors and the RH subjects made 123 errors. The mean total error and mean errors on the two idiom types for the normal versus the RH groups are given in Table 2. The total errors and errors for each idiom type from the control subjects were compared with those of the RH subjects using two-tailed t-tests for unrelated samples. These comparisons involved three tests. In order to maintain a reasonable error rate across these comparisons, an alpha level of .05 divided by the number of comparisons was used (Dunn, 1961). This yielded an alpha level of .017. None of the differences between the two subject groups was statistically significant.

Two-tailed t-tests for related samples were used to compare the mean number of errors on each idiom type within each subject group. For these comparisons an alpha level of .025 (.05/2) was used. Neither of these differences was statistically significant.

The percentages of errors in each of the qualitative scoring categories made by the normal and the RH subjects are given in Table 3. The distributions of errors among the error categories is similar for the two groups, with the exception of the percentage of concrete errors. However, of the 15 concrete errors made by the RH group, 13 were made by one subject.

Table 2. Mean (standard deviation) total error and errors on each idiom type for the normal and right hemisphere groups.

	Normal	Right Hemisphere
Total Errors	6.7 (2.49)	13.8 (7.86)
Single-definition Items	2.6 (2.01)	6.3 (4.18)
Dual-definition Items	4.2 (1.30)	7.4 (4.09)

Table 3. Percent errors of each type for the normal and right hemisphere groups.

Error Type	Normal	Right Hemisphere
Approximate	43	42
Incomplete	25	19
Concrete	2	12
Wrong	27	20
Don't Know	4	7

### DISCUSSION

The results of this study do not support the hypothesis that idiom type (single vs dual-definition) accounts for variability in responses on an idiom definition task. Nor do the results lend support to the notion of a separable lexical store for linguistic meaning.

A qualitative inspection of the error responses from both subject groups is revealing. The responses from the RH subject who made 13 of the 15 errors in the concrete category suggested support for the hypothesis that responses vary according to idiom type. More of his concrete errors appeared in the dual than in the single-definition idioms, as would be expected since it is difficult to be concrete on a single definition idiom. In fact, one might wonder how he could be concrete on idioms for which there is no "literal" translation. He managed to do so by responding to only one word in the phrase. For example, he defined "pleased as punch" as "hit someone." This failure to process the phrase as a whole in providing a literal response is interesting. This subject, like the others, did not have neglect according to our measures, but he was the only one whose attention level fluctuated during testing. It is possible that a more severely involved experimental group would reveal a similar trend toward concrete responses. This possi-

bility warrants further testing with more severely impaired subjects. Such a study is underway, though the results to date with six subjects also do not support the notion of variability according to idiom type.

Error responses from the normal group are remarkable both for their number and for how closely they approximate the types of errors from the RH group. Since defining idioms can be considered a highly verbal task, and since several of the RH subjects had a low level of education, care was taken to include control subjects whose professions did not require verbal proficiency. Five of the nine controls were laborers who, by self-report, were not very verbal. Most of the control group errors came from these five subjects. The quality and type of errors made by controls were not unlike those of the experimental group. This result is of clinical significance, since idiom definition tasks are often included in formal and informal diagnostic batteries for aphasic and RH patients (Schuell, 1972; Burns et al., 1985). This raises several issues for clinicians. First, it suggests that they should revise their expectations for their patients. Defining words is a highly abstract and verbally challenging task, and one that may overtax the patient's premorbid verbal skills. Defining idioms is perhaps even harder. It is also not something we are often called on to do. When, for example, we are asked by a foreign speaker to explain an idiomatic expression, most of us have difficulty finding other words to explain something so familiar in its standard form. This raises the question of whether we are testing our patients' understanding of figurative language or their capacity to define. In addition, many of our subjects used target idioms appropriately in sentences as they went through the process of thinking out loud during the task. This suggests that defining is not necessarily the best way to test understanding. Given these findings, perhaps clinicians should either include a word definition task in the figurative language section of their test instruments, or ask patients to demonstrate knowledge of figurative language in some other way.

Finally, it is assumed that we ask patients to define idioms not because we want to know if they can define idioms, but because we hope it will shed light on their ability to extend beyond the literal and appreciate the connotative and implicit meaning in communicative events and in all other aspects of their interaction with their environment. The notion of a "separable lexical store" for connotative versus denotative word meanings is something quite different. It implies that failure on an idiom definition task might represent a linguistic deficit in the retrieval of connotative word meanings, rather than a symptom of some more general deficit in the appreciation of connotative meaning itself. It implies that impaired recognition of connotative meaning can occur in isolation regardless of context. Such a possibility is quite different from the hypothesis that RH patients tend to be literal because they have not integrated contextual cues adequately, so that their ability to manage all aspects of implied or alternate meanings is impaired. While not negating the possibility, our data do not support the idea of "separable lexical stores." Subjects in both groups made numerous errors on both types of idioms without significant differences according to type. Their errors were mostly approximations of the accurate answer.

Why did our RH group have so much trouble defining idioms? Was it the figurative language itself, or the challenge of defining, or some other unknown factor? We cannot be sure, but our data at least demonstrate that non-brain-damaged people have trouble too. Finally, our data suggest that

the single versus dual-definition theory is not the key to understanding response variability on such a task.

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#### APPENDIX A

##### OPERATIONAL DEFINITIONS OF ERROR CATEGORIES

- 1) Approximate: a response which suggests some sense of the tenor or gist of the figurative meaning of the idiom, but which fails to state it

accurately. Example: "Out of the woods" defined as "You solved your problem and you got out in the clear. Come back to civilization."

- 2) Incomplete: a partial response which suggests, but does not fully state the figurative meaning. Example: "Out of the woods" defined as "To become clear, or I guess, to get well."
- 3) Concrete: a response which is a literal interpretation of the idiom as a whole or of individual words within the phrase. Example: "Out of the woods" defined as "falling trees."
- 4) Wrong: a response which is totally unrelated to the figurative or (when possible) the literal interpretation of the idiom. Example: "Out of the woods" defined as "Coming out of your way of living and trying somebody else's."
- 5) Don't know: a response in which the subject clearly indicates he has no knowledge of the idiom. Example: "Out of the woods" responded to by the words "Never heard of it."

#### DISCUSSION

- Q: I agree with you that asking people to generate definitions would not be a good way to study the way people go about dealing with idioms. And I also think we need to be careful of using idioms to study the more general use of figurative language and the ability to integrate language in context, because idiom is only one subset of metaphor, which is only one subset of indirect inference between speaker and meaning. Idiom could be almost treated as a vocabulary unit. I am wondering, too, if some people might not be familiar with some idioms just like they might not be familiar with some vocabulary.
- A: I think that's a good point. Most of our people knew the idioms. We didn't have that many "don't knows." They'd indicate somehow that they knew or were familiar with the idioms. I think our idiom group was a pretty familiar one to this population...but it is something to consider whenever you are doing idioms, obviously. They are localized to some extent.
- Q: Do you think localization of lesion in your pathologic group had any effect on your results? In particular, I am curious about the one outlier who was different from the rest of your right hemisphere group. I am curious specifically as to whether he was one of your subcortical patients and more specifically whether or not he was your first subcortical patient who had seemingly more extensive subcortical damage.
- A: Actually, it was our second patient who had basal ganglia damage according to the CT report. Localization isn't something we looked at a whole lot because I didn't think we had particularly good localization data to enable us to say anything really definite. I think this patient did have subcortical damage and may have had more difficulty because of that.
- Q: Some people have advocated that we think of idioms essentially as lexical entries; they are frozen meanings, so that we think of them as lexical entries. That is, that "out of the woods" is not different from "dog,"

or "cat." Other people have advanced the hypothesis that even for relatively frozen metaphors or idioms that there is a literal process of interpretation based on the literal meaning of the words, and only when that has gone through, is there a second system.

A: So, in other words, you analyze the meaning word-by-word and then reach the conclusion about the complete meaning.

Q: That's right. Might it be some attentional mechanism in these patients not to get the second meaning, given the hypothesis that comprehension of metaphors may require first accessing a literal meaning?

A: The fact that when they were concrete they often only related to one word in the phrase would be support for that attentional notion.