Dysnomia: A Rose by Any Other Name May Require Elaborate Description

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Naming problems are common in many who suffer brain injury. However, the way clinicians measure naming ability may lose information that would assist diagnosis, focusing treatment, and detecting improvement. Typically, naming behavior is evaluated with a binary, plus/minus, scoring system (e.g., Schuell, 1965; Spreen and Benton, 1969), or a multidimensional scale (Porch, 1967). While either may be appropriate for the patient who says "I don't know" or the one who calls a platypus an aardvark, neither adequately describes the patient who says "that's a /v/... Mt. St. Helens... thunder off the mountain... maybe it's rained on evidently like a thunder... not a thunder... waterfall or something? when confronted with a picture of a volcano. All three patients have difficulty naming. However, their treatment would probably differ. For example, the latter, verbose patient destroys some of the communication present in his lengthy response, because it is too lengthy. Further, he may lead himself astray along the hyperverbal path he paves. His treatment may focus initially on reduction of irrelevant information and preservation of information that communicates.

The purpose of this paper is to present a system for evaluating naming behavior. The system captures information lost in binary and multidimensional scoring systems. We will also show the system's use with a patient who suffered a traumatic brain injury. The initial clinical task was to determine what was wrong. This was followed by focusing appropriate treatment and measuring its efficacy. Existing scoring systems did not permit accomplishing any of these three needs.

CASE REPORT

MC, a 25-year-old male, was involved in an automobile accident. He was right-handed, had completed ten years of education, and worked at odd jobs. Diagnosis was closed head injury with a skull fracture in the left posterior parietal and occipital region. MC was comatose for seven days. An initial evaluation was done at four weeks postonset, and clinical contact continued for five weeks. When MC was discharged from inpatient status, he relocated out-of-state.

At four weeks postonset, MC's connected speech was fluent and characterized by long, well-articulated sentences which contained some awkward grammatical phrasing. Most striking was the content of his language, described by the rehabilitation team as bizarre and inappropriate.

The first task was to make a diagnosis. Our psychologist felt that MC had a schizophrenic language disorder. The speech and language pathologist knew his language was not right. It was not aphasia or the language of

confusion. Rather, it was the language we see in head trauma patients--for which we do not seem to have a name.

Table 1 summarizes MC's performance on speech and language measures. His PICA overall performance was at the 44th percentile. Auditory comprehension on the Token Test was impaired. Severity on the Boston Diagnostic Aphasia Examination (BDAE) was 2, and his profile resembled transcortical sensory aphasia.

Table 1. Patient speech and language data.

Measure	Results
PICA	
Overall	44th %ile
Gestural	26th %ile
Verbal	46th %ile
Graphic	60th %ile
Token Test	
Normal	10th %ile
Aphasia	40th %ile
BDAE	
Severity	2
Type	Transcortical sensory?

We were not happy with the label transcortical sensory aphasia, even though MC's performance matched the BDAE profile. While MC's repetition was better than his other verbal and comprehension skills, he initiated speech frequently and its content was original, not echolalic. Thus, we experienced the problem one has when trying to place the language deficits displayed by head-injured folks into aphasia's nosology. While MC's profile looked like transcortical sensory aphasia, it did not taste like transcortical sensory aphasia or tomato juice.

Next, we attempted to determine MC's candidacy for treatment, and, if he was treated, whether treatment effects could be measured. A system was developed to obtain a comprehensive description of his naming behavior. The system permitted descriptions of correct responses, and, when responses were incorrect, descriptions of their semantic, phonemic, and other relationships to the target. Table 2 shows the relationships and categories which comprise the descriptive scoring system. Behavioral definitions of each category are given in Appendix A.

Table 2. Relationships and categories comprising the descriptive scoring system.

Relationship	Categories
Semantic	Superordinate, subordinate, coordinate, description or associated object, action, agent, combinatory, functional context, other semantic relationship
Phonemic	Single phonemic error, multiple phonemic errors, incomplete phonemic relationship
Other	Perseverative intrusion, personal association, no response, rejection, denial, neologism, irrelevant or inaccurate, unclassifiable

Not only did this system describe the terminal response, it also described verbalizations prior to the terminal response. Because MC was verbose in picture naming tasks, we used the system to describe all of the behavior exhibited in his naming attempts. For example, earlier we mentioned his response to a picture of a volcano:

> "that's a /v/... Mt. St. Helens... thunder off the mountain... maybe it's trained on evidently like a thunder... not a thunder ... waterfall or something"

This response would receive a minus in a binary scoring system and a 6 on a multidimensional scale. Using the descriptive system, his response can be broken down into six segments. As can be seen from Table 3, the first segment, "that's a /v/," is a phonemic relationship and categorized as description or associated object. The fourth, "maybe it's rained on evidently like thunder," is an other relationship and categorized as irrelevant or inaccurate. The fifth, "not a thunder," is an other relationship and categorized as rejection. And, the sixth, "waterfall or something," is a semantic relationship and categorized as other semantic relationship. A second example of using descriptive scoring for analyzing naming behavior is given in Appendix B.

Table 3. Descriptive scoring of MC's lengthy naming response to the stimulus "volcano."

	Response Segment	Type of Target Relationship	Response Category
1.	"that's a /v/"	phonemic	incomplete phonemic
2.	"Mt. St. Helens"	semantic	subordinate
3.	"thunder off the mountain"	semantic	description or associated object
4.	"maybe it's rained on evidently like thunder"	other	irrelevant or inaccurate
5.	"not a thunder"	other	rejection
6.	"waterfall or something"	semantic	other semantic relationship

Stimuli used to assess MC's naming behavior were 40 pictures selected from the Boston Naming Test (BNT) (Kaplan, Goodglass, and Weintraub, 1976). At 4 WPO, MC's naming behavior was 30% correct on a +/- scoring system, produced a mean of 7.45 on the PICA scale, and produced 0% coordinates, 15.6% perseverative intrusions, 53.1% irrelevant or inaccurate, and 0% error recognition when scored with the descriptive system. Mean length of naming response was 3.8. All three scoring systems clearly indicated that MC had a naming problem, and improving naming was selected as a treatment goal.

Appraisal data were used to focus treatment. For example, if the PICA data indicated that the majority of MC's responses were delayed, we may have worked on decreasing delays. If the majority of his responses had required a repetition, we may have attempted to reduce the need for repetitions. But the PICA system did not describe MC's hyperverbal behavior before his final response. MC's naming attempts were lengthy. Our descriptive analysis indicated

that MC was not monitoring the appropriateness of what he said. He produced many perseverative intrusions and, at first, did not recognize their occurrence. Therefore, we began by helping him recognize his errors. The clinician pointed out every instance when MC responded with a previously-stated word or phrase that was inappropriate in the current context. We also used two treatment strategies to reduce MC's irrelevant language, and to control response content. First, simple action pictures were selected as stimuli, and second, MC was asked to state aloud the main person or persons and the action in the picture. Next, he was asked to describe each picture briefly. When he started to go astray, MC was brought back on task by the clinician saying, "Hold it. Who's the key person? What's that person doing? Now tell me what is happening in the picture." MC was treated six times a week, and data were collected at 4, 7, 8, and 9 weeks postonset.

Naming behavior improved during the five week treatment period. This change in naming behavior is shown in Table 4. If we had used only a binary scoring system, we would have seen a 20% improvement in naming accuracy. Using the PICA scale, we would have captured a change in accuracy, as well as some qualitative changes. However, many of MC's responses would have been scored "five" or "circled five." His PICA 12 and 7 behaviors, which he frequently rejected, would have been lost, unless we used the PICA diacritical scoring system (Porch, 1981).

Table 4. MC's change in naming behavior.

System	Weeks Postonset 4	7	8	9
Binary (percent correct)	30%	43%	43%	50%
PICA ($\bar{x}$ response score)	7.45	8.25	8.78	8.65
Descriptive				
$\bar{x}$ Length of response	3.8	12.0	9.6	6.5
Percent coordinates	0%	17.9%	10.1%	16.4%
Percent perseverative intrusions	15.6%	5.5%	2.2%	0%
Percent irrelevant or inaccurate responses	53.1%	6.3%	10.1%	1.4%
Percent error recognition	0%	10.2%	10.2%	19.2%

Utilizing the descriptive system, we observed the following:

1. At the end of treatment, MC used an average of <u>six words</u> to name a picture when only one was needed.
2. He increased the number of words related to the correct response; for example, in-class substitutions such as "map" for "globe," from 0% to 16% of his total response segments.
3. He eliminated all perseverative intrusions, such as giving previously correct responses that were not appropriate for the present stimulus.
4. He reduced irrelevant responses, such as "stones" for "antlers."
5. He increased his ability to recognize errors.

DISCUSSION

The descriptive scoring system assisted in focusing treatment and evaluating its efficacy. For example, changes in naming behavior were detected that were lost in +/- and PICA scoring systems. As a result of treatment, MC gave more semantically related information that increased the probability of communicating what he was unable to name. He eliminated perseverative intrusions, and he reduced irrelevant language markedly. Both of these behaviors had interfered with communication and tended to lead MC away from success. He also improved his ability to monitor the adequacy of his response. This information, lost in binary and multidimensional scoring systems, permitted measuring improvement in naming strategies and modifying treatment when necessary.

The elaborate system we used is not necessary with many patients. For example, if naming errors are confined to "I don't know," a minus or PICA "circled five" is adequate. However, some patients (such as MC) require a more comprehensive method for analyzing their naming behavior. We believe that the method presented permits elaboration when needed, but does not tax the time and talents of clinicians when plus/minus or multidimensional scoring may suffice. Use of the comprehensive scoring method may improve our ability to diagnose--for example, to differentiate aphasia from dementia or confusion. Its use may help us to prognose--for example, certain naming behaviors early postonset may forecast a more favorable future than other behaviors early postonset. Its use may help us to focus treatment--for example, we may work to reduce irrelevance and abundance rather than to focus on an increase in accuracy. Finally, its use may help us to measure progress--for example, to detect changes that are lost by traditional scoring systems. The "may," of course, will be modified by time and by data.

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APPENDIX A

DESCRIPTIVE SCORING SYSTEM

Stimulus: "Apple"

Relationship	Category	Description	Response	+/-	PICA
Semantic	Superordinate	Response naming the class in which the target is contained	"fruit"	-	12
	Subordinate	Response identifying a specific example of the target	"Granny Smith"	-	12
	Coordinate	Response that is an in-class substitution but specifically incorrect	"pear"	-	7
	Description or Associated Object	Response that is an adjective or phrase describing the target or names an object that is usually associated with the target	"red and succulent"	-	5
	Action	Response designating the action or function carried out by or with the target	"You bite into it"	-	5
	Agent	Response stating a person or animal that uses the target	"horses like 'em"	-	5
	Combinatory	Response composed of at least two consecutively produced semantically-related words with nominal form termination	"juicyeater"	-	5
	Functional Context	Response stating the situation or physical environment in which target usually occurs or is present	"from a tree"	-	5

Relationship	Category	Description	Response	+/-	PICA
	Other Semantic Relationship	Response suggesting a semantic association to the target, but does not clearly fit any of the previous categories	"it's Adam's"	-	5
Phonemic	Single Phonemic Error	Response in which target sound structure is preserved with exception of a single phoneme	/ɹebəl/	-	7
	Multiple Phonemic Errors -- Recognizable Production	Response in which at least two phonemes are in error or omitted, but unfamiliar listener would be able to identify as target	/wbəl/	-	4
	Incomplete Phonemic	Response in which only the initial sounds of the target are produced	/ɹep/	-	4
Other	Perseverative Intrusion	Response consisting of a previously-stated word or phrase	"saw"	-	5p
	Personal Association	Response suggesting reference to a personal situation	"We grew them in our back-yard"	-	5
	No Response	No verbal response within 15 seconds	---	-	2
	Rejection	Patient verbally dismisses prior response	"that's not it"	-	5
	Denial	Patient indicates inability to retrieve target	"I don't know the name"	-	5
	Neologism or Jargon	Single word response or response phrase containing nonrecognizable content	/nɹfɪk/	-	4

Relationship	Category	Description	Response	+/-	PICA
	Irrelevant or Inaccurate	Single word response or response phrase that includes inappropriate or inaccurate information about the target	"carpet"	-	6
	Unclassifiable	Response that does not clearly fit any semantic, phonemic, or any of the previous other relationships	"We got 'em there"	-	5

APPENDIX B

USE OF DESCRIPTIVE SCORING SYSTEM TO ANALYZE MC's NAMING RESPONSE TO THE STIMULUS "HARP"

Response Segment	Type of Target Relationship	Response Category
1. "I can't think of this at all"	other	denial
2. "I play a guitar and stuff"	other	personal association
3. "I just want to say that thing that you play over"	semantic	action
4. "piano"	semantic	coordinate
5. "but it's not"	other	rejection
6. "violin"	semantic	coordinate
7. "but that's wrong"	other	rejection

DISCUSSION

Q: Why didn't you include any syntactic descriptors in this system? It seems that it would be easy to do and you would capture some information. Also, can you expand on the type of treatment that was conducted in this study?

A: We didn't include any syntactic descriptors because our point of reference for development of this system was the verbal output of head-injured folks For our head-injured patients, syntactic errors were not frequent.

As far as treatment design, let me elaborate on what we did. One focus of treatment was to increase MC's awareness that he had a problem with using appropriate words during his connected speech and to teach him to monitor the semantic content of what he said. Please keep in mind that this was only one component of his total program. During the early phases of treatment, the clinician did three things every time MC responded with an inappropriate word. First, the clinician repeated the entire response, stressing the erred word. Then feedback that there was something wrong with that response was provided. Finally, the clinician restated the intent of his response correctly. Over time, the amount of clinician assistance was reduced as MC assumed more responsibility for marshalling and revising the semantic content of what he said. At this point, the clinician would repeat with a questioning intonation those responses that included inappropriate word selection. MC's task was to correct his response. Also, the use of a tape recorder was introduced. Each picture description was recorded and replayed so that MC could evaluate the semantic accuracy of his responses. Thus, identification of errors was transferred gradually from the clinician to the patient.

C: Getting back to my first question, it just seems that part of the "off-the-wall" stuff you're getting from the patient is some off-the-wall syntactic output and this should also be captured.

A: MC's syntax was only mildly impaired. Perhaps for other head-injured patients, this would not be the case, and closer attention to analyzing syntactic errors would be warranted.

Q: I was curious what you would do if your stimulus was <u>apple</u> and the person said "red ball." I couldn't find a place to put it in your taxonomy, but we sometimes see that kind of error. I would suggest that if you included a category "visually similar," you might tap this type of error strategy and be better able to differentiate naming patterns among the different kinds of neuropathologies.

A: Good point. The example you give would be categorized as <u>other-unclassifiable</u> in our taxonomy. Our categories were designed to be mutually-exclusive so we use the <u>other-unclassifiable</u> category to hold responses that might be interpreted in more than one way. "Red ball" may be judged as an <u>irrelevant</u> response or visually related to the target, as you suggest. A rule we use when there are a lot of <u>other-unclassifiable</u> responses is to look carefully at the specific responses. We have the option to create a new response category to describe a subset of responses for an individual patient.

Q: I'm curious about how many other patients you've used this system with and how well it captures their naming behavior.

A: The caseload I treat is head-trauma patients, both acute and long-term. With the long-term patients, I don't use this system because it seems that if naming problems are present, they don't surface on a confrontation naming task. I have found descriptive scoring helpful with many of the acute head-injured patients we see early post injury. Our goal with this group of patients may not be to evaluate naming <u>per se</u>, but to try to get a handle on the patient's language processing strategies. Confrontation naming provides a predictable language context to do so.

I did use this system with one patient whose etiology was a right CVA. His naming attempts were not irrelevant, but they were long and overloaded with information. An additional part of this system which is not on the handout is to judge the communicative value and efficiency of what the patient has to say. For this right CVA patient, it was helpful to review with him all the different semantic information he produced and to look at the order in which this information was provided. The patient learned to zero in and provide the most essential information. So this system permitted us to show improvement for this patient as an increase in what we call a "communication score," based upon the amount, type, and order of semantic information given.

C: (Co-author) I work in an outpatient clinic where I'm using this system primarily with head-injured patients. It gives me the most information when a patient falls within the moderate to severe range. When the deficit is mild, there are too few errors to generate a pattern to be used to focus treatment. I have used it a couple of times with aphasic patients and, for the most part, I'm finding it's not providing me any additional information that I cannot get when I use multidimensional scoring. This system has also been useful for some right-hemisphere-injured patients with naming problems. They are often able to get their idea across in a semantically related way, and with descriptive scoring, I'm able to capture this strategy of communicating what cannot be named. At other times, I see a pattern that is amenable to treatment.

Q: I'm curious about why you brought up the issue of whether or not your patient had transcortical sensory aphasia at all. You said the patient didn't have some of the central symptoms so why did you concern yourself with it at all?

A: In my clinical work with head-injured folks, I use portions or all of various test batteries that were developed for aphasic individuals. The Boston is one such tool and it has provided me with some good information about my patients. MC did have transcortical sensory aphasia on the Boston even though the rest of his behavior told us this label was inappropriate. Our point is that when clinicians use a language test that was designed for a different population, caution should prevail in the way testing data are interpreted. Interpretation of testing results directs treatment focus. To treat our patient as having transcortical sensory aphasia, even though he profiled this way, would have been a grave mistake.

Q: I'm curious about what you suspect the neuropsychological mechanisms were that resulted in the kind of naming deficit you were seeing. Second, do you see a hierarchial relationship in your categories, which represents some sort of progression, analogous to a multidimensional system?

A: For your first question, if I have it right, you're asking what I think was going wrong with this patient. I think part of the problem was the attentional difficulties we see in head-injured patients. MC had difficulty staying focused on the task, although his responses indicated that he was somewhat focused. If you look at his response to "volcano," there was some sort of relationship between consecutive segments, but his total response lacked cohesiveness. Also, at first, this patient's self-monitoring skills were not working. He needed to listen more closely to what he said.

With regard to your second question, the way we arranged the different categories was not meant to indicate a hierarchy. It is simply a listing of the various ways a response may be described. We demonstrated how one response may be broken down into multiple response categories. For a wordy patient, one index of change is the order of category selection within a response; that is, the way information flows and the way the total response communicates. The order of response categories can vary in so many ways that it is impractical, if not impossible, to establish a fixed hierarchy that applies to all patients. However, hierarchial patterns within an individual patient usually emerge. For example, the patient who changes from a response pattern of other-irrelevant followed by other-denial to a pattern of other-irrelevant followed by other-rejection followed by semantic-coordinate is improving.