

Back to the Drawing Board: A Treatment Program for Nonverbal Aphasic Patients

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Despite our best efforts as clinicians, some adult aphasics remain unable to communicate through verbal expression. When this occurs, a nonlinguistic approach such as drawing may become an alternative. There are few reports of the compensatory use of drawing for purposes of communication in aphasia (Ajuriaguerra and Hecaen, 1950; Hatfield and Zangwill, 1974). One of the most impressive accounts of the use of drawing to facilitate communication and rehabilitation in aphasia is that of Sabadel, a former graphic illustrator (Pillon, Signoret, Van Eeckout, and L'hermite, 1980). As the result of a stroke, Sabadel was unable to articulate words, yet he could copy and soon draw common objects with his nonpreferred left hand. With guidance, his drawing skills improved to the talented expression of complete concepts (agent, action, and object) with both simple and complex themes.

Many aphasic patients do not possess notable artistic talent premorbidly, nor are they proficient at using drawing communicatively. There has been a need, therefore, for a systematic drawing program for this group. One such program has been developed by Lyon and Sims. In 1984 they reported encouraging preliminary results from two patients who worked primarily on drawing objects and depicting action, first in a copy condition and subsequently from memory. This sparked our interest and in 1986 we initiated a project, the goal of which is to teach patients to communicate messages through sequential drawings.

This paper describes this experimental program we call, "Back to the Drawing Board" (BDB), and the response of two severely aphasic patients who have completed the program. The implications of this preliminary work will be discussed.

METHOD

Treatment Program. Treatment begins using five uncaptioned, one-panel cartoons (all cartoons were selected from compilations of work by professional cartoonists). We chose cartoons as treatment stimuli based on the findings of Gardner, Ling, Flamm, and Silverman (1975) that even severely aphasic patients can appreciate and discriminate visual humor in the form of uncaptioned cartoons. Cartoons also have the advantage of conveying single events (one panel) or sequential events (two or more panels) through black and white line drawings. To begin, the patient is shown the first one-panel cartoon for a short period of time, after which it is removed from view. He or she is then asked to draw the cartoon from memory. Criterion performance is the reproduction of a recognizable drawing which contains details critical to the humorous aspect of the cartoon (artistic excellence is not the objective). If the drawing is unsatisfactory, verbal instruction, demonstration, or practice through copying is provided until the patient is able to draw the cartoon from memory at criterion level. Once a recognizable and

clear reproduction of the cartoon is produced from memory, the second one-panel cartoon is introduced. If after four trials of drawing from memory the patient does not meet criterion, that particular cartoon is eliminated. When criterion has been met for 3 of 5 one-panel cartoons, the patient is introduced to two- and finally three-panel cartoons using the same procedure. See Figures 1 and 2 for examples of a cartoon stimulus and cartoon reproductions.

Dependent Measure. The dependent measure for BDB is the patient's pre- and post-treatment depiction of 9 brief "accidents of living" enacted by another person. These are similar to those used by Hatfield and Zangwill in 1974. For our program there are 3 one-part scenes (e.g., a woman dropping papers on the floor), 3 two-part scenes (e.g., shuffling cards then losing control so they scatter), and 3 three-part scenes (e.g., writing with a pencil, having the pencil break, sharpening it) (Appendix A). Immediately after the scene is enacted patients are given the appropriate number of blank 5" x 5" cards and asked to draw what just took place.

Selection Criteria. Subjects met the following selection criteria:

1. Aphasia Severity Rating according to the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1983) of 1.5 or less, indicating that, at best, communication is through fragmentary expression with need for inference, questioning, and guessing by the listener.
2. At least partial credit (1) must be earned on the Boston Assessment of Severe Aphasia (BASA) draw-a-man task, that is, a drawing of a figure which is partially recognizable as a man.
3. Correct manual sequencing of at least 4 of 5 of the two- and three-part cartoons.
4. Correct identification of the humorous aspect/detail of 4 of 5 of the one-, two-, and three-panel cartoons.

Subjects. Patient A was a 62-year-old, right-handed white male with a high school education who suffered a left CVA (see Appendix B) in October 1985 which left him with what was described as global aphasia and right hemiplegia. A retired computer salesman, he spent 2 months at two rehabilitation facilities before being admitted to the Boston Veterans Administration Medical Center (VAMC) in May 1986 for evaluation and treatment. At the time of admission to the VAMC his speech was sparse, effortful, dysarthric, and generally stereotypic with occasional appropriate use of three and four word phrases. According to the BDAE, auditory comprehension and writing were areas of relative strength. He often communicated his ideas successfully through writing and gesturing. Finger and limb praxis as tested on the Boston Praxis Examination (BPE) was unimpaired. Prior to beginning in BDB this patient was seen at the VAMC for approximately two months, a minimum of three times weekly. During this time, he progressed rapidly through a number of treatments. This included all levels of Bucco-facial Visual Action Therapy (VAT) and Melodic Intonation Therapy (MIT). He responded poorly to a program for agrammatism. Although his gestural communication improved, none of these methods improved his conversational speech skills. In September 1986, at about one year post onset, he entered the drawing program. He was seen as an outpatient for one-hour sessions two times a week for 15 sessions.

Patient B was a 65-year-old, right-handed white male with a high school education who suffered a left CVA (see Appendix B) in February 1985. This

left him essentially mute and severely hypophonic with nonfluent verbal output restricted to occasional whispered phonemic stereotypies. Auditory and reading comprehension as assessed on the BDAE were areas of relative strength. Functional communication was described as fair to good, because he effectively used gestures, facial expressions, writing of single letters, head nods, and occasionally drawing. Limb and finger praxis as assessed with the BPE were within normal limits. As a retired lift operator and custodian, he did not have any notable premorbid drawing skills. Patient B received individual treatment (including complete Limb and Bucco-facial VAT programs, Level 1 of MIT, and Promoting Aphasic Communicative Effectiveness (PACE) (among other approaches) for a minimum of three times weekly for approximately one year with no appreciable change in his verbal output. At one year post onset he entered the experimental BDB program. He was seen as an outpatient two times each week for one hour sessions for a total of 17 sessions.

Analysis. After completion of the drawing program, the patients were asked to draw the 9 scenes or "accidents of living" as they had done prior to treatment. For the pretreatment drawings, 10 naive judges (5 for each patient) were asked to write a brief description of what was conveyed by the randomly ordered drawings of the 9 events. Ten additional judges (5 for each patient) were asked to do the same task for the post-treatment drawings. A comparison was made of accuracy of the judges' descriptions for the pre- and post-treatment drawings (see Figures 3-5 for examples of pre- and post-treatment drawings).

To facilitate comparison and interpretation, "accuracy" was evaluated in terms of 1) number of scenes for which the "gist" was accurately described, 2) number of correct main parts of the sequence identified, 3) number of objects depicted that were accurately labelled, and 4) accurate identification of sex of the person(s) depicted in each scene. Greater accuracy of judges indicated better performance by the patient.

To judge overall improvement of the patient's drawings, 10 other judges (5 for each subject) (with prior knowledge of the enacted scenes) viewed randomly-ordered pre- and post-treatment pairs of drawings and selected the member of the pair which they considered to be better. All judges were normal adults from a cross-section of non-art-related occupations.

RESULTS AND DISCUSSION

Because no clear pattern of differences in judges' accuracy was apparent between one-, two-, and three-part scenes, raw scores were collapsed and percentages calculated for each patient across all 9 scenes. While patient A's baseline performance was superior in all areas to that of patient B, both patients improved notably after treatment (Table 1).

Patient B improved an average of 23 percentage points for gist, main parts, and objects and Patient A an average of 19 percentage points. Patient A was relatively successful in depicting sex of the person(s) in a scene both before and after treatment (55% vs. 63%). Patient B, however, showed dramatic improvement from 17% (pre-treatment) to 51% (post-treatment) on this measure (Table 2).

As already mentioned, overall improvement was evaluated by judges with prior knowledge of the enacted scenes. They judged 76% of Patient A's and 84% of Patient B's post-treatment drawings to be better than pre-treatment drawings when confronted with pre- and post-treatment pairs.

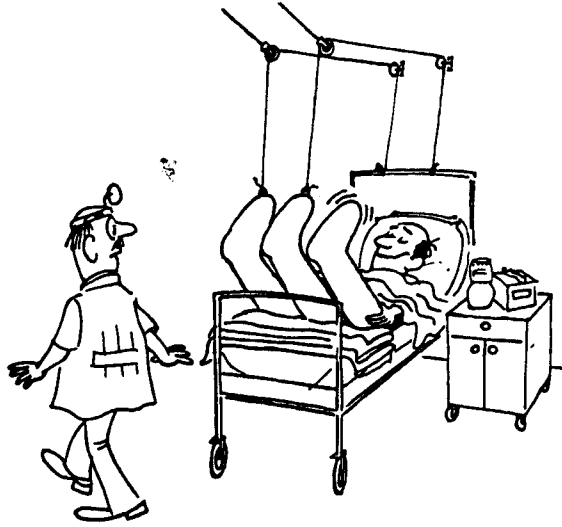


Figure 1. One-panel cartoon stimulus.

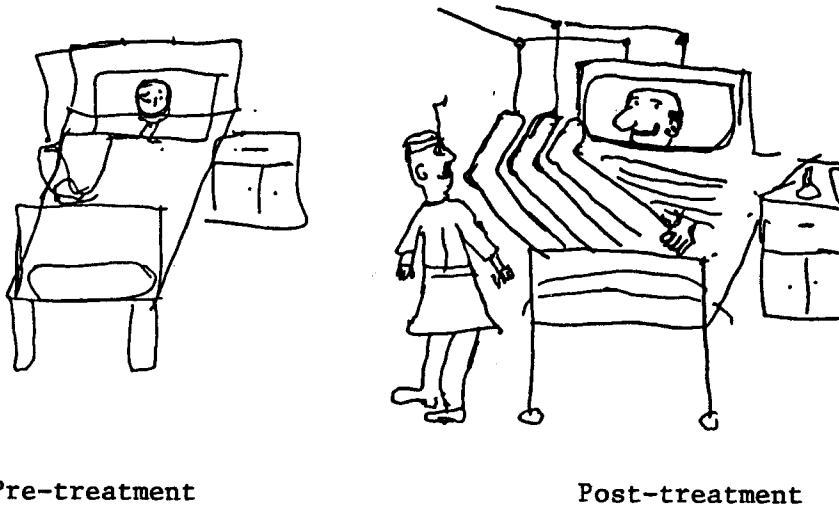


Figure 2. Patient A -- Pre- and post-treatment cartoon reproduction.

Table 1. Mean accuracy scores and standard deviations () for one-, two-, and three-part scenes.

Category	Gist	Main Parts	Object Label	Sex
Total Possible Points	9	18	16	9
<u>Patient A</u>				
Pre-treatment	4.4 (.89)	4.4 (1.5)	7.2 (3.1)	5 (2.2)
Post-treatment	6.2 (1.64)	7.2 (3.1)	10.2 (2.38)	5.6 (3.2)
<u>Patient B</u>				
Pre-treatment	2.2 (1.09)	2.4 (1.5)	3.4 (2.2)	1.6 (.89)
Post-treatment	4.4 (.89)	6.4 (2.3)	7 (2.12)	4.6 (.89)

Table 2. Percent accuracy for one-, two-, and three-part scenes.

	Patient A		Patient B	
	Pre	Post	Pre	Post
Gist	48	69	24	49
Main Parts	24	45	13	36
Object Labels	45	63	21	44
Sex	55	63	17	51

The data from these two patients clearly show that ability to depict sequential events and details critical to those sequential events improved after treatment with BDB. That is, they were able to learn to convey information more effectively through the use of drawing alone. This has important implications for a program such as BDB as a treatment alternative for other patients with severely limited verbal expression. BDB is particularly attractive because it is easy to administer, regardless of whether or not the clinician has artistic talent, and our patients progressed relatively quickly. We have also found that BDB sets the stage for expansion to more situational and interactive uses of drawing (e.g., relating a story, leaving messages, asking questions). We plan to use a slightly modified BDB with more patients to further evaluate its utility as a treatment tool. In addition, we are continuing, albeit informally at this point, to explore the use of drawing as an aid to more complex and interactive communication tasks with the hopes of developing a means of communication which is as useful to the patient outside of therapy as it is during therapy.

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APPENDIX A

One, Two, and Three Part Scenes

A. One Part Scenes.

1. A woman puts up an umbrella which has one broken spoke.
2. A woman carrying papers drops them on the floor.
3. A woman pours water into a cup which has a hole in the bottom so that the water leaks out.

B. Two Part Scenes.

1. A woman is shuffling cards and loses control of them so they scatter on the table.
2. One woman goes out a door as a second woman is coming in the same door. They bump into one another.
3. A woman turns on a fan so that pieces of paper on a table blow all over.

C. Three Part Scenes.

1. A woman waters a plant on a table. Some water spills over and the woman wipes it up with paper towels.
2. A woman is writing on paper. The pencil she is using breaks so she sharpens it.
3. A woman walks into a dark office. She turns on a light and opens the drapes.

APPENDIX B

Lesion Description

Patient A. There are possibly four left hemisphere lesions: 1) The first involves the anterior-middle portion of the middle temporal gyrus and continues into the posterior-superior portion of the left temporal lobe with patchy involvement to about half of Wernicke's area. Superior lesion extension involves

motor and sensory cortex and supramarginal gyrus areas, surface and deep with involvement in periventricular white matter. 2) A subcortical lesion in the posterior limb of the internal capsule, inferior insular structures, and parts of the temporal isthmus. 3) Patch involvement of the middle temporal gyrus with superior extension into parts of the angular gyrus. 4) A lesion involving the mesial portion of the motor cortex and the supplementary motor area.

Patient B. A left hemisphere lesion involving less than half of Broca's area, with deep extension into the insular region and possibly the lateral putamen. A superior lesion extension involves the premotor, motor, and sensory cortex and the corona radiata deep to these areas.

DISCUSSION

- Q: Did you have more than one pretreatment measure of their drawing performance?
- A: The drawings of the scenes were what we used for the study, though we did have other pretreatment measures such as drawing objects from memory and copy and stick construction from memory and copy, if necessary. At this point they did not provide us with a lot of information pertinent to this study, so we did not include them in our discussion.
- Q: I would be more comfortable with the results if there had been several sessions of testing because it seems that exposure to drawing, for someone who's not been doing it, might give you some of the results that you saw from pre- to post-treatment.
- A: While that is something to consider, I'm not sure I would go along with it in this case. There is quite a difference between drawing a person carrying out some activity which the patient must retain and reproducing (after specific training) a relatively simple line drawing such as a cartoon. Also, if there was improvement as a result of exposure to drawing we would expect to see improvement in the cartoon drawing as the patient progressed from one cartoon to the next and this was not the case. These two patients took approximately the same number of trials to reach criterion regardless of when in the treatment program the cartoon was introduced.
- Q: One of the problems with using drawing is that communication is inefficient, it takes a long time and you have to have something to draw on and draw with. We've found that patients who do well put too much in the pictures and that adds to the time it takes to convey a message. So we've found it necessary to reduce the amount of detail and your program seems to encourage detail, sometimes unnecessarily. Could you comment?
- A: First, it's important to remember that other means of communication may also be less than efficient with verbally restricted patients. In terms of the amount of detail incorporated in patients' drawings, we chose to use sequential drawings because our experience has been that in an attempt to communicate patients might spontaneously draw a single object, without any context. Then you spend a lot of time trying to figure out what they're trying to get across by the one isolated object. We thought that getting them "into the set," so to speak, of drawing sequential

pictures might help them provide the additional context necessary to aid communication. The program is structured to focus on only those details critical to the message depicted in a sequence and in fact, the uncaptioned cartoons we use as treatment stimuli provide a good model for efficient communication through line drawings. To this point, we have not had difficulty with patients including too much detail, but rather in their wanting to take extra time to make their drawings as perfect as possible.

Q: I have some questions about the nature of the treatment because these guys seem to do very well in a relatively short time. I guess I would be confused as to when you decide that they're just not going to be a good drawer and how much of the treatment involves making sure they understand the gist of what it is they're trying to draw? What do you do with a guy who doesn't draw well?

A: As part of our selection criteria patients had to be able to sequence 4 of 5 of the two and three panel cartoons and identify the humorous aspect of 4 of 5 of the one, two, and three panel cartoons. We did that because in a cartoon the humorous aspect is a crucial detail and relates closely to the gist. These particular patients had no difficulty with that. If we had patients who had difficulty and did not meet our selection criteria we would question whether it would be beneficial to go further. At this preliminary stage we might want to try it and see how the patient progressed, but in general I would be reluctant to go forward with someone having trouble in these areas.

Q: Do you find with some patients that you can teach them to draw, but they won't choose to initiate communication with it?

A: Yes. That can be a problem, which is why we think it's important to extend this program to include the spouse or family members as the patient learns to use drawing as a means of communication in an increasingly interactive way.

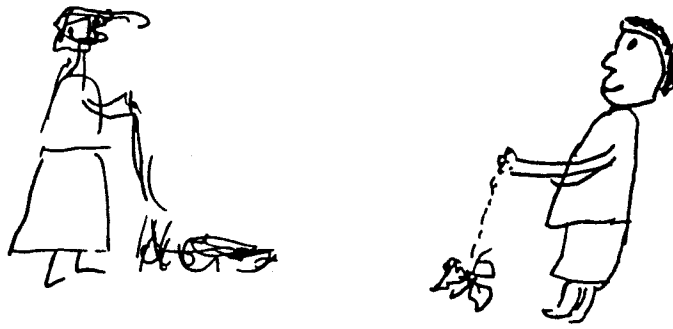


Figure 3. Pre- (left) and post-treatment (right) drawings of one-part scene "woman dropping a handful of papers" by Patient B.

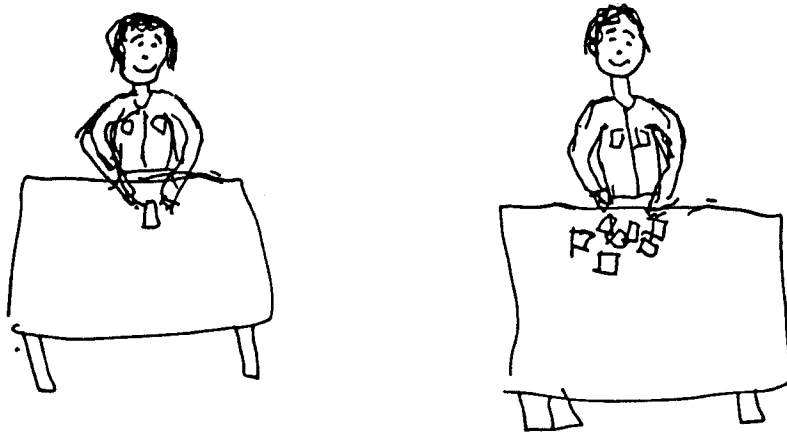


Figure 4. Pre-treatment drawings by Patient A of a two-part scene "woman shuffling cards" (left) and "losing control so they scatter" (right).

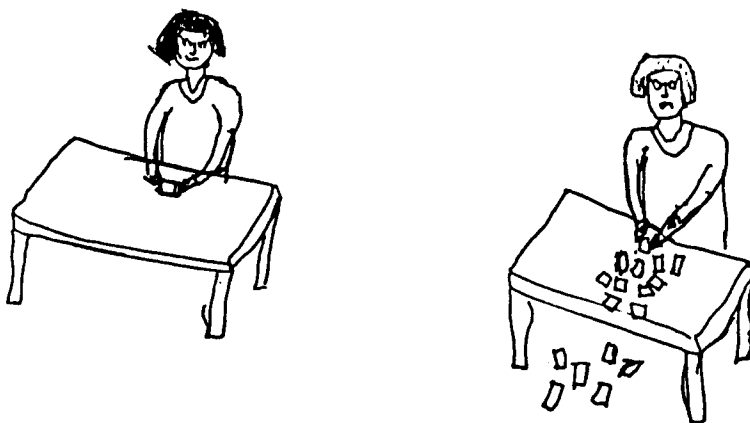


Figure 5. Post-treatment drawings by Patient A of two-part scene "woman shuffling cards and losing control so they scatter."