CHAPTER

24

Drawing:
Its Use as a Communicative Aid with Aphasic and Normal Adults

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For expressively restricted aphasic (ERA) adults, the likelihood of being an "active contributor" within a communicative exchange diminishes as speech rehabilitation fails to attain functional levels. Traditionally, these noncommunicators have depended on supportive others to extract diverse needs and desires through pictured and printed communicative boards and/or simple questions. Pantomime (Rao, 1986) and visual computerized language (Steele, Weinrich, Kleczewska, Carlson, and Wertz, 1987) have been pursued as viable alternatives. Yet, to date an effective dyadic exchange of common concepts or experiences from daily living, familiar as well as novel, remains the target rather than an attained objective.

Drawing or sketching represents still another entrant in this pursuit. Pillon, Sighoret, van Eeckout, and Lhermitte (1980) reported a case study of a graphic illustrator, Sabadel who, despite being rendered nonverbal and hemiparetic from a massive cerebral stroke, progressively developed an elaborate and sophisticated use of sketching for communicative purposes. More recently, Trupe (1986) described a drawing treatment program derived by modifying Visual Action Therapy and PACE formats. Beginning with the sketching of isolated objects and actions to the expression of concrete and abstract concepts within communicative dyads, she sampled the performance of 15 aphasic adults (five global, five severe Broca's, and five severe Wernicke's). All subjects were successful in learning to convey simple, concrete concepts. However, only severe Broca's aphasic adults displayed any mastery of complex stimuli within communicative dyads containing an unfamiliar interactant. Morgan and Helm-Estabrooks (1987) introduced a novel drawing treatment program where single-, double-, and triple-panelled cartoons were used to teach basic drawing skills. Prior to initiating treatment, two ERA subjects drew a series of "enacted" accidents of daily living. Treatment incorporated the use of copying, demonstration, and verbal instructions. Both ERA adults drew sketches of cartooned panels until their drawings could be recognized by naive interactants. Once criteria levels were achieved, subjects redrew the accidents of daily living. For both subjects, 75 percent or more of post-treatment drawings were judged to be superior to pretreatment efforts. Finally, Yedor and Kearns (1987) used response elaboration training to expand recognizable semantic content units within the sketches of an ERA adult. They found that this training effectively transfered to novel contexts as well as novel interactants.

Collectively, the data from these studies indicate that drawing does aid simple and, in some cases, even more complex communiqués of ERA adults and their interactants. Also, they support the contention that drawing skills of ERA adults do improve with practice. Yet how completely ERA adults can communicate through the use of drawing is less well

known. To better define this, we compared the drawings of ERA adults to a matched group (number, age, years of education, and years of artistic training) of normal adults who drew with both dominant and nondominant hands. Also, we explored the effectiveness of a drawing program that emphasized the refinement of basic drawing skills within an established communicative context.

METHOD

SUBJECTS

Eight ERA adults, 75 years of age or younger, at least 1 year post-onset with vascular lesion sites confined to the left hemisphere, screened normal for auditory or visual acuity, overall Porch Index of Communicative Abilities (PICA) scores between the 15th and 45th percentile and a mean percentile score of 30 or greater on auditory comprehension subtests from the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1983) served as subjects. Another group of eight normal adults of comparable ages, sex, years of education, and years of formal art training served as controls. No experimental controls were included in this investigation, as the selected ERA adults had already completed extensive speech/language rehabilitation programs and had achieved maximum linguistic and communicative gains prior to entry into this study.

ASSESSMENT MEASURES

For ERA adults, pre- and post-treatment measures were obtained for communicative effectiveness, recognition of drawings, visual organization skills, block construction, and limb apraxia. Identical pretreatment measures were administered to all normal adults. However, since normal adults exceeded treatment criterion levels for communicative effectiveness when restricted to the use of drawing, no formal training was given to this group.

Two measures of communicative effectiveness were used with ERA adults. The first was a 40-item drawing outcome measure. Initially, 80 proposed test items were administed to four ERA-normal adult dyads. Based on these dyad's communicative effectiveness scores, two forms (A and B) were constructed of equated difficulty (Appendix A). The first 10 items consisted of isolated objects; the next 10, actions or emotions; the third 10, *wh-* questions; and the last 10, problem solving or sequential events. One form served as a pretreatment measure, while the other evaluated post-

treatment performance. Each pre- and post-treatment evaluation required two separate administrations: one with and one without the use of drawing. A 3-day interval between administrations and randomized orders of test stimuli was used to minimize interactant learning effects. Gestures, writing, and speaking were encouraged during the nondrawing condition. Order of presentation for drawing outcome forms and drawing/nondrawing conditions was counterbalanced across subjects. In addition to an untrained normal interactant, data from a "trained" interactant (a family member or friend who attended weekly training sessions and was taught strategies for extracting content from the ERA adult's drawing) were collected following treatment.

Test items from drawing measures were evaluated in a PACE-like format (Davis and Wilcox, 1981). ERA adults were given a 3-minute interval to communicate stimuli to naive, normal interactants. All stimuli were presented to ERA adults auditorily and pictorially (a sketched representation displayed for 2 to 3 seconds) with the exception of *wh-* questions and problem solving, which were given only auditorily. For the drawing condition, subjects completed sketches prior to initiating the PACE-like exchange.

Normal adults completed only the drawing condition on the pretreatment measure. During the PACE activity, they were restricted verbally and gesturally to a "yes-no" response. Hand usage was counterbalanced across subjects. To sample handedness differences within subjects, the first 20 items of the post-treatment measure were administered using the opposite hand of the post-treatment measures.

The second measure of communicative effectiveness used in this study was the PICA (Porch, 1981).

The Hooper Visual Organization Test (Hooper, 1958), Wechsler Adult Intelligence Scale (WAIS) Block Design (Wechsler, 1955), and selected portions of the Boston Limb Apraxia Battery (Helm-Estabrooks) were administered prior to and following the treatment protocol.

TREATMENT FOR ERA ADULTS

Following pretreatment measures, ERA subjects participated in a 3-month PACE-like, drawing-aided treatment program. Treatment sessions were held three times weekly for the duration of an hour. Attention was focused initially on establishing or refining primary drawing skills (form, spatial organization, detail, and perspective), but whenever possible with defined communicative contexts. ERA subjects were provided with salient visual contexts to draw (e.g., you hit a $1,000 slot or you spent the afternoon sleeping in a hammock in the backyard). When drawings failed to reach "recognizable" levels, verbal cuing ("Where's the slot machine?" or

"Where's the hammock?") and graphic cuing (drawing a portion of the missing part [the slot or hammock] or enlargement of a distorted part ["Redraw this part here, but make it larger."]) were used. Each drawing was subsequently placed in a PACE-like interaction with the trained interactant. Strategies given to the participant to follow to optimize communicative effectiveness during this exchange are shown in Appendix B. An average rated score of six or better on an ordinal scale of eight (five consecutive drawings over three consecutive sessions) was sought before moving to sequential depictions (two, four, or six parts).

SCORING PROCEDURES AND ANALYSIS OF DATA

Communicative effectiveness and recognition of drawings were rated on two separate ordinal scales by two independent judges (Appendix C). Interjudge agreement exceeded 90 percent on this measure when comparisons permitted deviations of a single point.

Ordinality of each scale was established by asking five separate judges independently to order the descriptions and definitions provided for each level from least to most. Orders between four of the five judges were identical to the order shown here. A reversal of scaled values four and five occurred with the fifth judge.

A Wilcoxon Signed-Ranks test was used to determine levels of statistical significance for ordinal data for communicative effectiveness and recognition of drawings.

RESULTS

Mean rated scores for communicative effectiveness (CE) with normal and ERA adults are shown in Figure 24-1. The shaded upper portion of each column represents one standard error. The far left column in this figure for the ERA adults represents pretreatment CE without the use of drawing, roughly 60 percent of the scaled value of the normal adults CE drawing score. A substantial CE gain ($p < .02$) was realized simply through the introduction of drawing (middle ERA column) and further improvement ($p < .05$) followed treatment. In the end, ERA adults attained 88 percent of the normal adults CE score.

Figure 24-2 contains CE values for ERA adults comparing traditional (nondrawing) and drawing-aided communiqués with naive and trained interactants. There was a slight gain in pre-, post-treatment nondrawing scores, although this difference failed to attain statistical significance ($p > .05$). Also, trained, familiar interactant scores only slightly exceeded those of the nontrained interactant ($p > .05$).

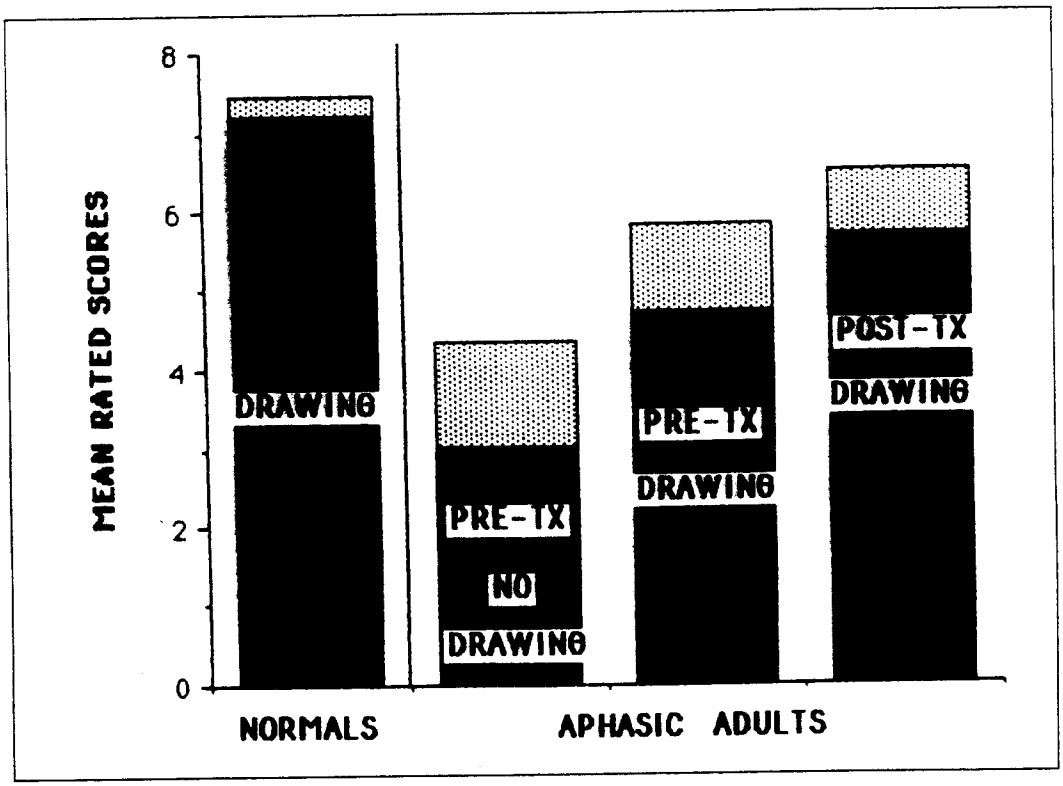

Figure 24-1. A comparison of mean rated communicative effectiveness scores for normal and aphasic adults.

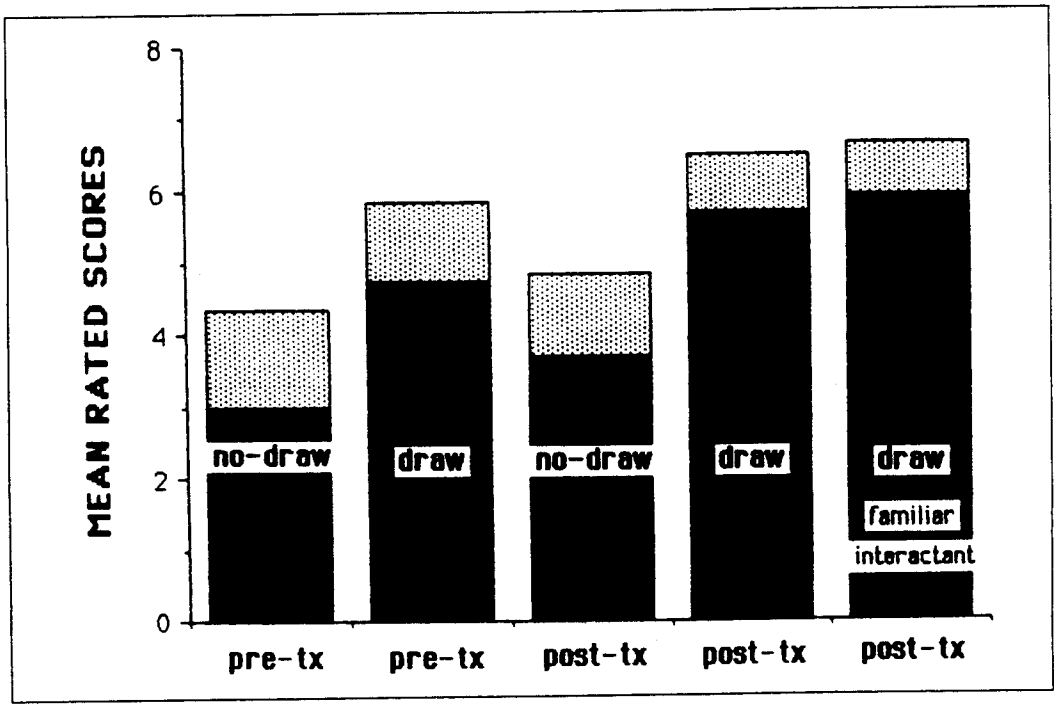

Figure 24-2. Communicative effectiveness scores for aphasic adults with and without the use of drawing before and after treatment.

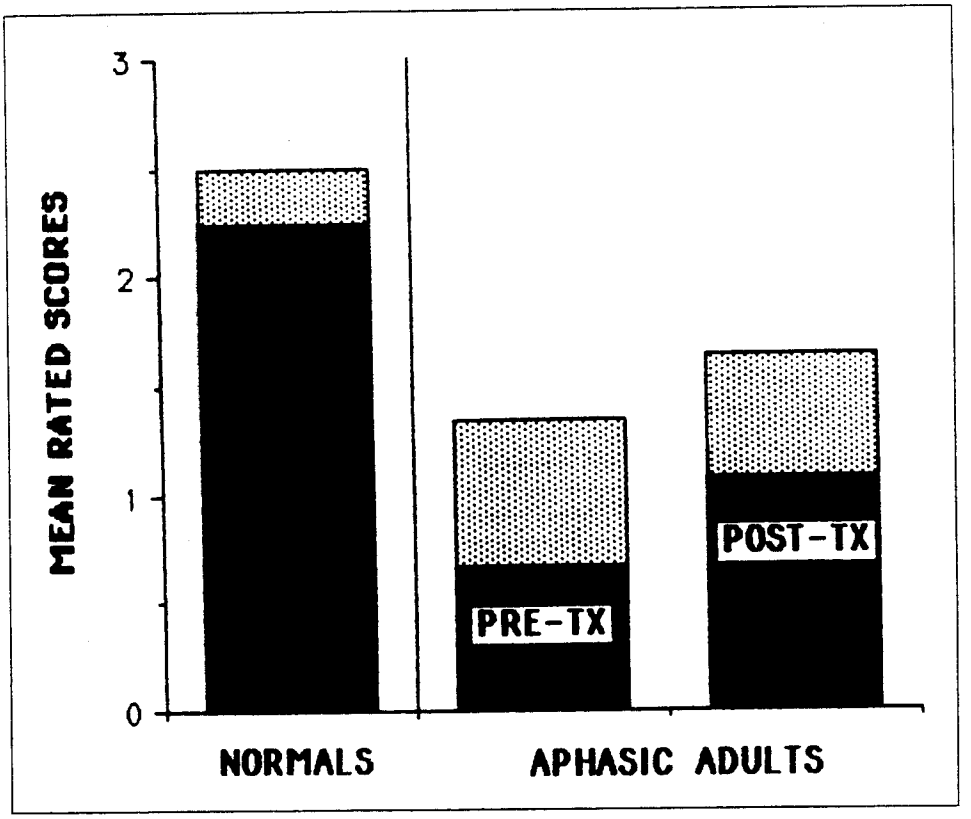

Figure 24-3. A comparison of mean rated recognition scores for the drawings of normal and aphasic adults.

In Figure 24-3, data pertaining to recognition of drawing (RD) are displayed. Normal adults drew more recognizable depictions when compared to ERA adults ($p < .01$, both before and after treatment). ERA adults improved with treatment ($p < .05$) but only achieved 65 percent of the scaled RD score for normal adults. When we compared right versus left hand use in normal adults, RD values did not vary statistically significantly ($p > .05$), although they did favor the dominant side. Subjectively, we judged the length of time to draw the sketch as longer when using the left hand.

Figure 24-4 shows pre-, post-treatment comparisons for the PICA, BDAE, WAIS, Hooper, and Boston Limb Apraxia. Only the PICA resulted in a significant statistical difference ($p < .05$). We examined the locus of where within the PICA the greatest changes occurred. Both copying and pantomime subsections exhibited statistically significant changes ($p < .05$).

DISCUSSION

Hughlings Jackson (Head, 1915) maintained that aphasic adults had a deficit in their ability to propositionalize, not an absence of words per

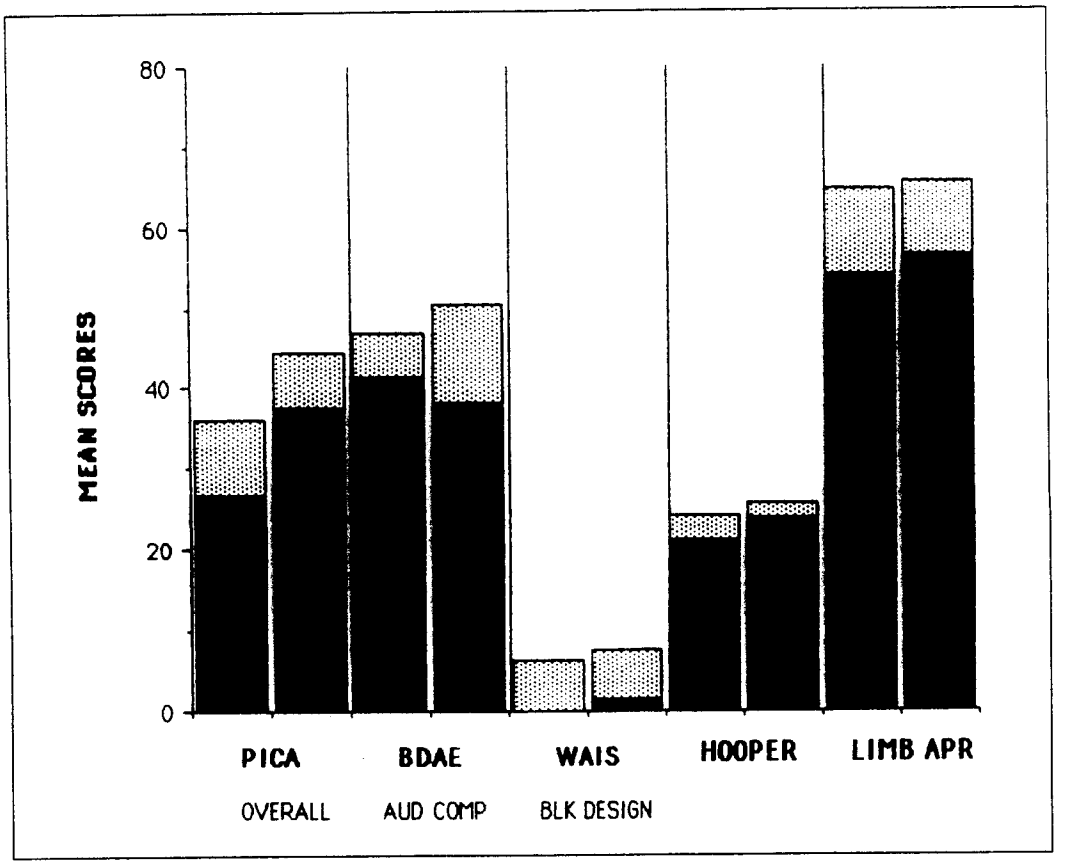

Figure 24-4. A comparison of pre- and post-treatment measures for aphasic adults.

se. Seemingly his intent in making this differentiation was that the underlying concept to be conveyed was largely preserved but that the linguistic process to accomplish this (selection and ordering of words) was not. Thus, the problem facing ERA adults as communicators is how to access and temporally arrange symbols to meet their communicative needs.

Speech and gesture share a common denominator as expressive modes in that they are transitory. Whereas ERA adults may locate internally a symbol to be communicated, it may be lost before being incorporated into the desired context or conceptual framework. In fact, for many ERA adults, the process of short-term retention of one component while activity searching and/or trying to arrange other components within a communiqué may be mutually exclusive.

Our data suggest that drawing may serve as an important facilitator in this process. Unlike the transient forms of verbal and gestural symbols, drawing is fixed or static, a permanent representaton of that underlying the concept. Furthermore, even though it may not be that recognizable to others, if it is clear to its originator and our data suggest that it often is, this mode provides a referent that is modifiable. Our responsibility, then, as

clinicians is to explore and specify how best to use this tool for communicative purposes.

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APPENDIX A

DRAWING OUTCOME MEASURES

Pretreatment	*Post-treatment*
Objects	
1 toothbrush	knife
2 comb	key
3 piano	bathtub
4 ship	bus
5 man	monkey
6 horse	zebra
7 theatre	church
8 gas station	grocery store
9 old car	first date
10 new car	marriage
Actions or emotions	
11 running	swimming
12 flying	jumping
13 car/flat tire	somebody stubbing toe
14 fire hydrant/uncapped	grocery sack/something leaking out
15 person roping calf	catching a butterfly with a net
16 somebody falling off bike	somebody slipping on banana peel
17 flood	fire
18 avalanche	auto wreck
19 happy	sad
20 angry	sleepy
Wh- questions	
21 what is the Starship Enterprise?	what was the Hindenberg?
22 what was King Kong?	what is a kodiak?
23 what is Bud?	what is Shredded Wheat?
24 what is the Kentucky Derby?	what is the Indianapolis 500?
25 who is Bob Hope?	who is Mickey Mouse?
26 who is Joe Namath?	who is Babe Ruth?
27 who was Custer?	who was Patton?
28 who was Hitler?	who was Winston Churchill?
29 where is the Grand Canyon?	where is the Statue of Liberty

Pretreatment	*Post-treatment*
29 where is the Grand Canyon?	where is the Statue of Liberty?
30 where is Mt. Rushmore?	where is Yellowstone National Park?
Problem solving	
31 somebody break in/ neighbor's	pilot went out/furnace
32 dog hit/crossing street	water pipes froze/prolong cold
33 shopping/store . . . left present	luggage/didn't show — NY
34 found/checkbook sidewalk	lost wallet/department store
Related sequences/2 parts	
35 wash clothes/hung them out	awoke/took a shower
36 hit ball/fielder caught it	bowler threw ball/got strike
37 butterfly flew in window/ plant	airplane-cargo door open/landed
38 mouse left hole/ate cheese	geese saw hunters/flew away
Related sequences/six parts	
39 girl on park bench/banana	man driving truck/bee
40 TV repairman/antenna	woman/spider/diamond ring

APPENDIX B

STRATEGIES/SUGGESTIONS GIVEN TO THE TRAINED INTERACTANT TO WORK ON WITH THE ERA ADULT IN THE PACE-LIKE EXCHANGE

1. State the general theme if recognizable
2. If not, get "oriented" to drawing:
   Determine perspective.
   Important elements:
   The setting.
   Main objects.
   Who.
3. Ask patient to identify most important part of drawing.
4. Ask patient to enlarge this portion.
5. Ask patient to show you what you do with this portion.
6. Reformulate every 2 minutes what you feel you know about the drawing.

APPENDIX C

RATING SCALE OF COMMUNICATIVE EFFECTIVENESS

8 — Accurate, complete identification of the stimulus(i) within the first minute.
7 — Accurate, complete identification of the stimulus(i) within the second minute.
6 — Accurate, complete identification of the stimulus(i) within the third minute.
5 — Accurate, incomplete identification of the stimulus(i) within 3 minutes.
4 — Inaccurate, related, identification of the stimulus(i) within 3 minutes.
3 — Inaccurate, remotely related, identification of the stimulus(i) within 3 minutes.
2 — Inaccurate, unrelated, interactive effort to identify the stimulus(i) within 3 minutes.
1 — Inaccurate, unrelated, noninteractive effort to identify the stimulus(i) within 3 minutes.

Incomplete: Prime content of the stimulus(i) was conveyed but necessary details were not or were omitted.
Related: General content of the stimulus(i) was conveyed but not the precise theme (semantically related) or conveys specific features within the appropriate context for the stimulus(i) but omits the precise theme.
Remotely related: Provides features of the stimulus(i) but without or not in an appropriate context.
Unrelated: Provides no insight into the intent of the stimulus(i).

RATING SCALE FOR EASE OF RECOGNITION OF DRAWINGS

3 — Accurate, complete identification of drawing(s).
2 — Accurate, incomplete identification of drawing(s).
1 — Inaccurate, related identification of drawing(s).
0 — Inaccurate, unrelated identification of drawing(s).

Incomplete: General form of drawing is identified correctly but lacks specific details to complete the necessary intent.
Related: Visually related to the intended form (e.g., nail is labelled a pen) but inaccurate.
Unrelated: No similarity to intended form.

DISCUSSION

Q = question; A = answer; C = comments.

Q. Would you describe what you mean by a "PACE-like" activity, that is, with reference to the four basic principles? Did you use some, eliminate some, or modify others?

A. The exchange of content between aphasic adults and their normal interactants differed depending on whether drawing was permitted or not. When it was, the aphasic adult's sketched representation was completed before the interaction began. We placed the drawing in front of the normal interactant and allowed the use of any medium (speech, pantomime, additional drawing, and/or writing). They had 3 minutes to decipher the intent of the sketch. In the nondrawing condition, the aphasic adult was told and, in some instances, shown the item to be communicated. Occasionally, we imposed a short delay (20–30 seconds) between stimulus presentation and the initiation of the interaction when the aphasic adult possessed functional verbal repetition skills. After the interaction began, aphasic adult and normal interactant could use any medium other than drawing (speech, pantomime, writing).

Q. I, too, have been very excited about the use of drawing since attending an earlier workshop of yours. I know you have a wealth of information and experience with this. Have you ever used this in groups where other aphasic adults serve as their own interactants? If so, how has it worked?

A. I've done this but only briefly. Several aphasic participants within this study convened for three to four sessons as a group following individual treatment. I would have liked to continue this, but two of these patients returned to their homes, which were outside the Reno area. For the time that we did meet, a theme was selected (Where did you go over the weekend? What did you watch on TV last night?); participants drew their own response. Afterwards, we reviewed each. Often participants would add their thoughts to another's completed sketch, either to clarify what they thought the picture was or explain a similar happening of theirs. On one occasion, an aphasic adult snatched the drawing from another group member before he could complete it because he had conflicting information to share. Strangely, it looked like a conversation should sound. For low-level aphasics who possess functional receptive skills, this may represent fertile ground to be explored.

I should note, too, that this group experience has aided my management of the ERA-normal dyad. From watching ERA adults communicate with one another, I was struck by the need to require the normal interactant to use drawing as they "talked" with the aphasic adult. This promotes equal status with what is a substandard form of expression. Unless you make the ERA adult feel like he or she is engaged in a mutually agreed upon and respected form of communication, it will never transcend anything other than an augmentative status. When ERA adults drew with other ERA "drawers," they seemed much more at ease with and quick to initiate its use. Of course, there are other factors that might contribute to increased ease with which ERA adults communicate with one another. But a shared communicative format seemed fundamentally important. Finally, if both communicators sketch, it provides ongoing models of how to draw novel concepts. In general, ERA adults loved seeing how other aphasic adults had expressed their thoughts. Certainly, it stood to reason that ERA adults might benefit from viewing how normal interactants express concepts gramatically too.

Q. Along the same lines as using naive drawers and group therapy, you recently mentioned the use of computers for drawing with ERA adults to me. Have you done any more with that?

A. I'm currently pursuing the development of a Macintosh program that will permit photographic detail of single events to be transformed into a sketched format. Initially a scene/happening is displayed on the computer's video monitor in photographic detail. While the ERA adult watches, a software-directed revision begins. Using a broadened dark trace, a computer program superimposes a line around those graphic features from the scene that are essential to its recognition. Once completed, the photograph is faded from the screen, leaving only the sketched version. The intention of this program is to mirror the progress of transferring a visual concept held in memory to its usable, graphic, communicative form.

C. It sounds like a great supplementary activity to having a teacher try to teach them to draw too.

Q. How many of your ERA adults in this study are currently using drawing as a communicative means in their daily lives?

A. Three of the eight currently use it. However, two of the three that do, do so only sparingly. The reason being that they now either speak, gesture, or write well enough to preclude its use. Only when these more conventional and easier accessed modes fail do they resort to drawing. This fact underscores an important principle that I'm never out

to institute the use of drawing beyond its communicative value to the user. For the five that don't use it, I feel it's directly tied to the absence of one or more normal interactants within their immediate living environment who have been trained adequately and are comfortable with its use. I'm actively pursuing the placement of communicative partners with these ERA adults.

Q. Are you suggesting then that the drawing facilitated the use of other forms of expression? If so, what do you think is underlying this?

A. Much has been said about intersystemic stimulation. My observation is that this is but another form. But as I've suggested, because drawing has a static, permanent form, it may be more facilitatory than even gesture or pantomime. I can only say that frequently ERA adults would begin to draw objects or forms and spontaneously produce a recognizable verbal or printed label.

C. We've recently completed a Master's study using the Boston Naming Test, not in a confrontation matter, but in more of a responsive naming format (e.g., With what do you sweep the floor? What's the structure you live in?). It was administered to approximately 15 aphasic adults of varied etiologies under two conditions: with the use of drawing and without. The dependent variables were amount and accuracy of verbal output. Without exception, aphasic adults did better in the drawing-aided condition. Now whether it's the drawing per se or simply the process of focusing on the visual image of the object to be drawn is unclear. Also, all of our subjects could name to some degree, which was not the case in this study. But even for severe/global aphasic adults, much like those reported in our study before this forum last year (Morgan and Helm-Estabrooks, 1987), there has been the continued, effective use of drawing for communicative purposes within a group setting at our facility. We thank you for getting us started with drawing.

Q. Do you feel that you actually teach the aphasic adult to draw? In a separate study of ours, I'm convinced we didn't teach drawing but only expanded upon a residual skill. Do you have any thoughts or opinions on this?

A. A couple of thoughts come to mind. First, left-hemisphere brain-damaged adults do not draw normally. So if, in part, your question is addressing the concept of a left/right hemisphere dichotomy of cortical functions that would purport the use of an "unimpaired" region of the brain with ERA adults, this simply is not the case. But the evidence is that many aphasic adults do retain sufficient graphic skills to draw "communicatively," that is, they can approximate the forms they want the listener to recognize although they may leave out cri-

tical details. Second, these absent critical details can be recovered. My best clinical advice would be to do so through a communicative context rather than through set exercises that "teach" drawing (i.e., copying, drawing objects in isolation, etc.). When you pursue the latter (I mistakenly did so earlier), you often confuse the patient in terms of intent. They become more concerned with "artistic" worth within the drawing instead of its "communicative" value.

Q. Some years ago I treated a patient who was a well-known graphic designer in New York. He was a conductive aphasic. He felt his perspective was off. Although from our view, he was wonderful. He subsequently ran an art therapy group for aphasic adults, relying largely on collage as an expressive milieu. In many instances, it seemed to me they only succeeded in making a big mess, but it was interesting to see how enthusiastic they were about these creations. I wondered if you could comment on that?

A. Again, a couple of thoughts. The literature suggests that previously trained (professional) artists retain artistic integrity despite suffering a stroke that induces aphasia. Probably, the most publicized case is that of the graphic illustrator, Sabadel, who began sketching in a crude form soon post-onset and progressed within a duration of a year to drawings that were sophisticated, abstract expression of his feelings concerning the stroke. As to the significance of the use of collage, I know art therapists have documented gains in mood and emotional status with stroke patients through the use of painting. Obviously, though, this use of art in this respect is divergent from what's been presented in this study.

Q. My question addresses the preferential information processing, that is, there may be some aphasic adults who process information better if reliant on auditory/phonemic dues while others may benefit from more of a visual/pictorial focus? Do you have a feeling for such a differentiation?

A. An excellent question. Gainotti and colleagues (1983) tried to determine which aphasic adults would be better adept at drawing objects from memory. Interestingly and not too surprisingly, the severity of aphasia did not predict who could or could not do this task. Rather it turned out that intactness of receptive semantic skills appeared to be the best indicator. This suggests that a conceptual wellness internally is needed to make use of a pictorial system expressively. It may be requisite as well to a preferential auditory processing system too. But I suspect that pictorially oriented processor must excel at visualizing concepts to be expressed. How exactly to get at that information remains unclear.