

CHAPTER

**32**

**The Effects of Picture  
Content on Descriptions  
By Aphasic and  
Non-Brain-Damaged  
Speakers**

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Picture description is the primary means for eliciting connected speech from aphasic adults. The Minnesota Test for Differential Diagnosis of Aphasia (MTDDA) (Schuell, 1972), the Western Aphasia Battery (WAB) (Kertesz, 1982), and the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1983) all contain subtests in which examinees are asked to describe a picture. The pictures from the three tests are shown in Figure 32-1.

Several things about these pictures should be apparent. Probably the most striking thing about the pictures is that the MTDDA and WAB pictures resemble each other more than they resemble the BDAE picture. The MTDDA and WAB pictures portray several relatively independent events, with no obvious connections among them. The BDAE picture seems more story-like than the other two, with relationships implied between the characters and events portrayed.

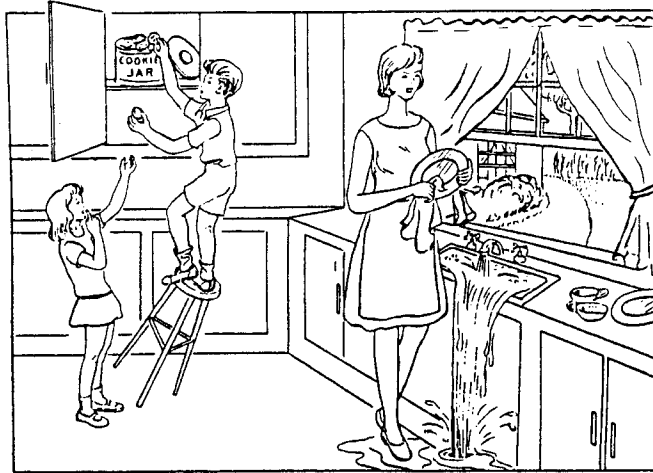
A few years ago, one of our clinicians, after testing an aphasic patient with the WAB, commented on the patient's tendency to name picture elements, without describing any relationships among them. This led us to look at the other two major aphasia tests that elicit connected speech with a picture. It seemed obvious to us that the pictures from the WAB and MTDDA were likely to elicit naming behavior and that if we wished to get something approximating a story from our patients, our best bet was the BDAE picture.

At about this time, Louise Correia was considering potential topics for her Master's thesis at the University of Minnesota. One day she commented that she had been struck by the female bias of the picture from the BDAE. It seemed to Louise that the scene portrayed in the BDAE picture might be more familiar to women than to men and that women might have more to say about it than men would. It was suggested to her that she pursue the question of gender bias and that she also incorporate an evaluation of the BDAE, MTDDA, and WAB pictures in terms of the amount of naming that they elicited.

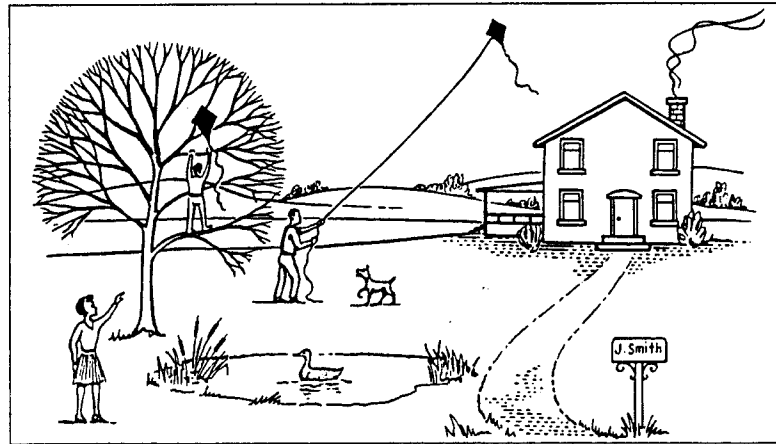
She agreed, and we designed a study to evaluate two questions. The first was, "Do the pictures from the BDAE, MTDDA, and WAB differ in the amount, efficiency, or kind of speech that they elicit from aphasic and nonaphasic adults?" The second was "Does the gender bias of pictures effect what aphasic and nonaphasic speakers say about them?"

## SUBJECTS

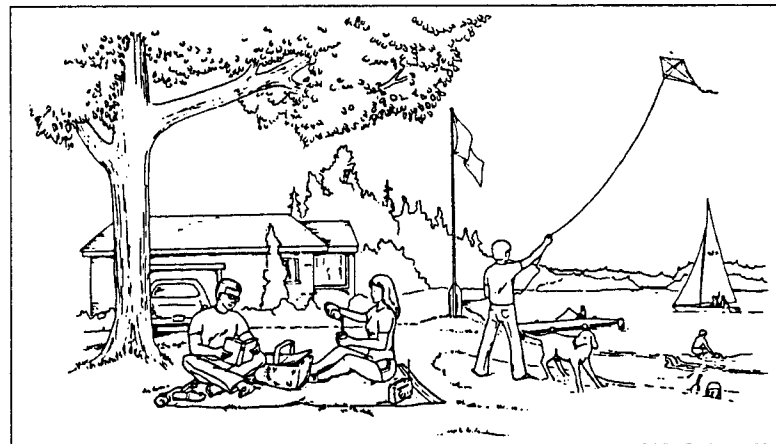
Subjects were 12 nonaphasic, non-brain-damaged men and 12 men with aphasia resulting from single left-hemisphere cerebrovascular accidents



A



B



C

**Figure 32-1.** Speech elicitation pictures from the Boston Diagnostic Aphasia Examination (A), the Minnesota Test for Differential Diagnosis of Aphasia (B), and the Western Aphasia Battery (C).

who were at least 1 month post-onset of their aphasia. Nonaphasic subjects were adults with no history of neurologic dysfunction.

Each subject's aphasia was categorized as nonfluent, fluent-anomic, or fluent-mixed. Each subject's aphasia severity was estimated with the Severity Rating Scale from the BDAE. Aphasia severity ranged from 3 to 5, and the mean aphasia severity rating for the 12 subjects was 4.0.

## MATERIALS

Stimulus materials consisted of nine pictures. Three were the pictures from the BDAE, the MTDDA, and the WAB. Six were gender-biased pictures based on Norman Rockwell paintings. Three depicted male-oriented situations (Fig. 32-2, *left*) and three depicted female-oriented situations (Fig. 32-2, *right*).

We asked 12 graduate students in communication disorders to estimate the gender bias of the Rockwell pictures and the aphasia test pictures. They were shown the nine pictures in random order and were asked to indicate whether each picture was "male biased," "female biased," or "neutral" and to estimate the degree of gender bias for each picture on a five-point scale, with one indicating weak gender bias and five indicating strong gender bias.

Three Rockwell pictures were judged to be female biased and three were judged to be male biased (Table 32-1). The picture from the BDAE was judged to be female biased, and those from the MTDDA and WAB were judged to be neutral (Table 32-1). One of our male-biased pictures (the voting booth) was judged to be relatively weakly male biased. We were concerned that this might lessen our chances of finding significant effects of gender bias. To check on that, we analyzed the data once with all six Rockwell pictures and once with only four, the two strongest male-biased pictures and the two strongest female-biased pictures. The results were identical for the two analyses. When we report the results, they will be for the analysis including all six Rockwell pictures.

## PROCEDURES

The experiment was carried out in a quiet room. The experimenter instructed the subject about the task and provided practice and instruction using two pictures similar to the Rockwell pictures used in the experiment. When the experimenter felt that the subject understood the task, the three aphasia test pictures and six Rockwell pictures were presented

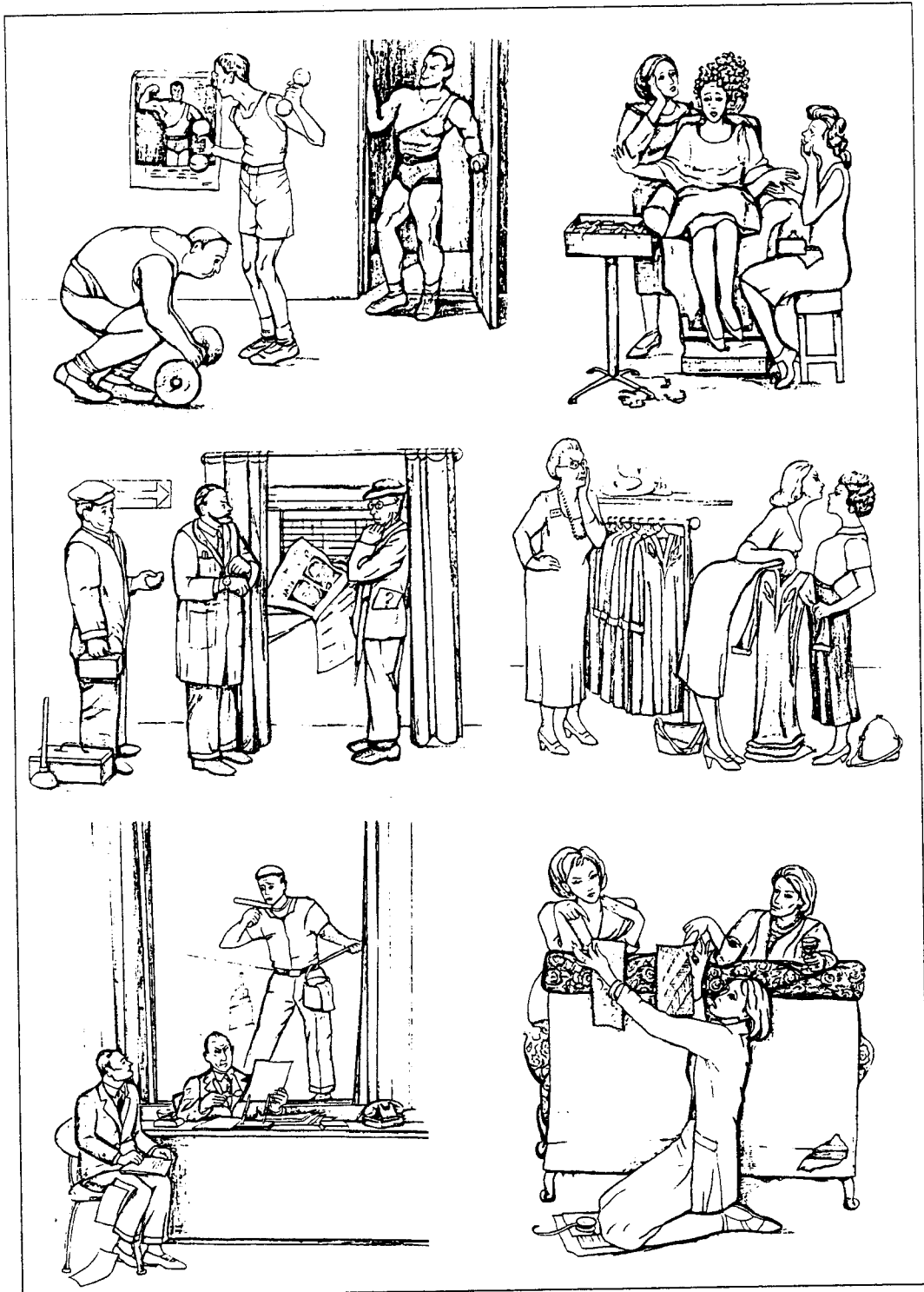


Figure 32-2. Male-biased pictures (left) and female-biased pictures (right) used to elicit speech from subjects in this study.

**TABLE 32-1. JUDGES' AVERAGE GENDER BIAS RATINGS FOR ROCKWELL PICTURES AND APHASIA TEST PICTURES**

<i>Picture</i>	<i>Gender bias</i>	<i>Average rating</i>
Rockwell pictures		
Beauty shop	Female	4.58
Dress shop	Female	4.17
Living room	Female	3.42
Gymnasium	Male	4.92
Office	Male	3.25
Voting booth	Male	1.67
Aphasia test pictures		
BDAE	Female	3.42
WAB	Female	0.08
MTDDA	Male	0.33

BDAE = Boston Diagnostic Aphasia Examination; WAB = Western Aphasia Battery; MTDDA = Minnesota Test for Differential Diagnosis of Aphasia.

one at a time in random order, and the subject was asked to describe each of them.

Each picture description was tape-recorded and orthographically transcribed. The following measures were obtained from the transcriptions:

1. The number of words in each transcript.
2. The average number of words per minute for each transcript.
3. The number of correct information units in each transcript divided by the number of words spoken.
4. The number of nouns and adjectives in each transcript, divided by the number of correct information units. We called nouns and adjectives "enumerative information units." Enumerative information units are a measure of the tendency to name or describe picture elements.

Correct information units and enumerative information units are measures that we devised at the Minneapolis Veterans Administration Medical Center several years ago and for which we have established satisfactory reliability.

## RESULTS

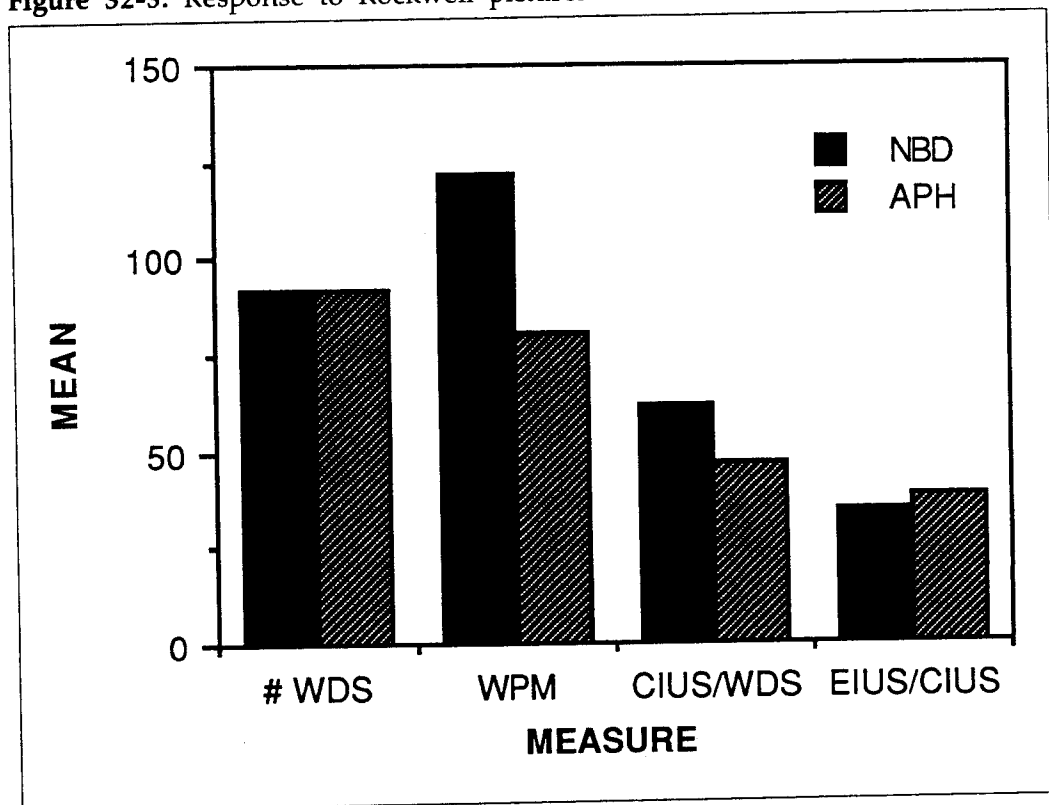
The scores for aphasic and non-brain-damaged subjects for each of the measures and each picture were analyzed by analyses of variance and appropriate follow-up tests, and the following results were obtained.

The presence of aphasia affected responses to gender-biased pictures and aphasia test pictures similarly (Figs. 32-3 and 32-4). For both sets of pictures, non-brain-damaged subjects generated significantly more words per minute and significantly more correct information units per 100 words than aphasic subjects. Aphasic and non-brain-damaged subjects did not differ in the number of words or the amount of enumeration given in response to either set of pictures.

Aphasic and non-brain-damaged subjects produced significantly more words in response to male-biased pictures than in response to female-biased pictures (Fig. 32-5). Gender bias did not appreciably affect speech rate for either group (Fig. 32-6). There were no statistically significant effects of gender bias on the ratio of correct information units to words, although aphasic subjects produced slightly lower information ratios to female-biased pictures than to male-biased pictures (Fig. 32-7). There were no statistically significant effects of gender bias on the amount of enumeration (Fig. 32-8). Aphasic subjects were slightly more enumerative with male-biased pictures than with female-biased pictures, while the converse was true for non-brain-damaged subjects.

The figures relating to the effects of aphasia test pictures include average performance on the Rockwell pictures. However, no statistical comparisons were made between aphasia test pictures and Rockwell pic-

Figure 32-3. Response to Rockwell pictures.



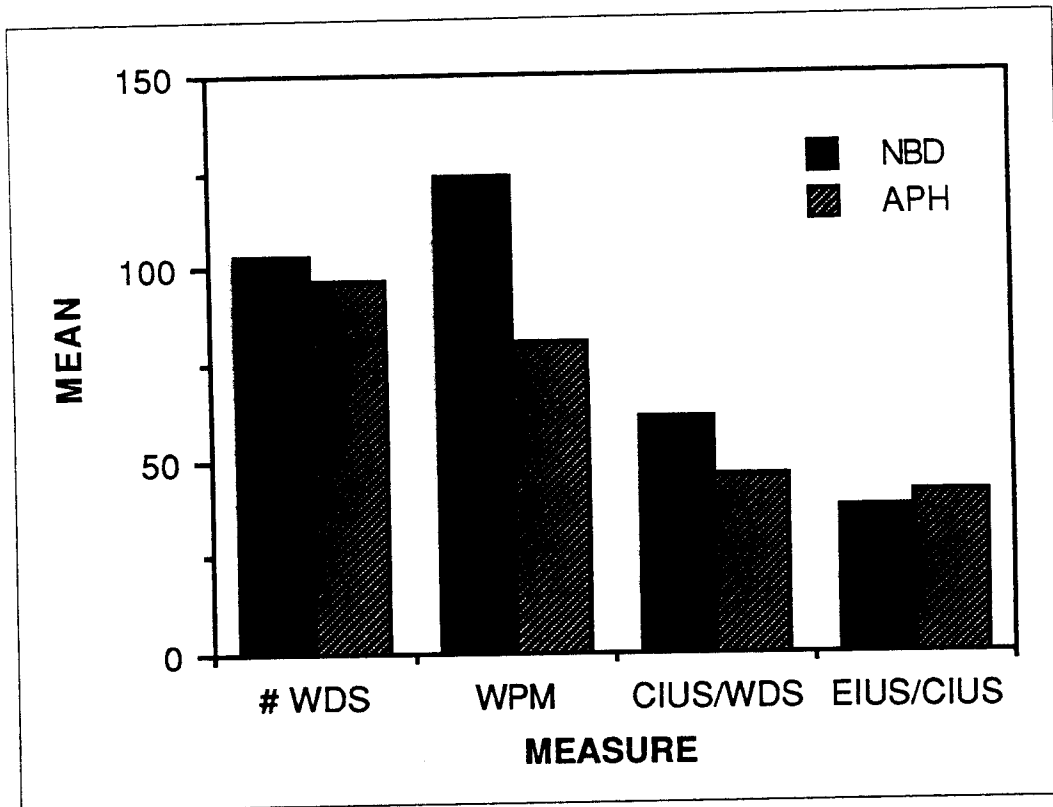


Figure 32-4. Response to aphasia test pictures.

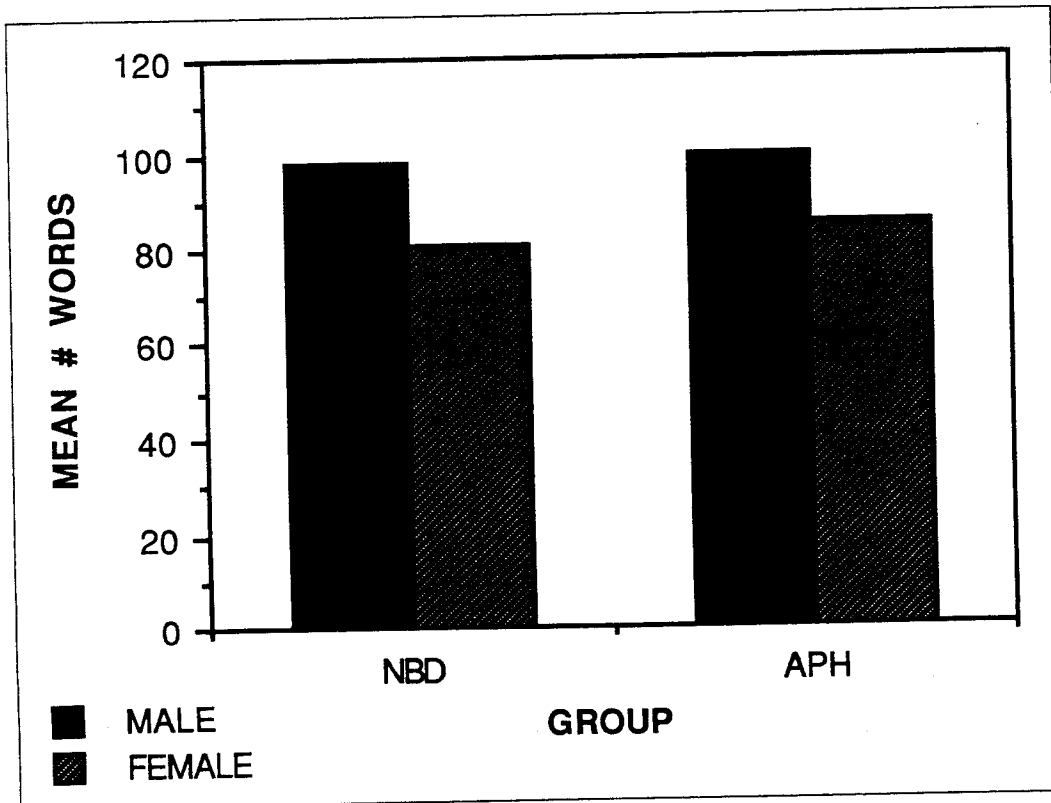


Figure 32-5. Response to gender-biased pictures.



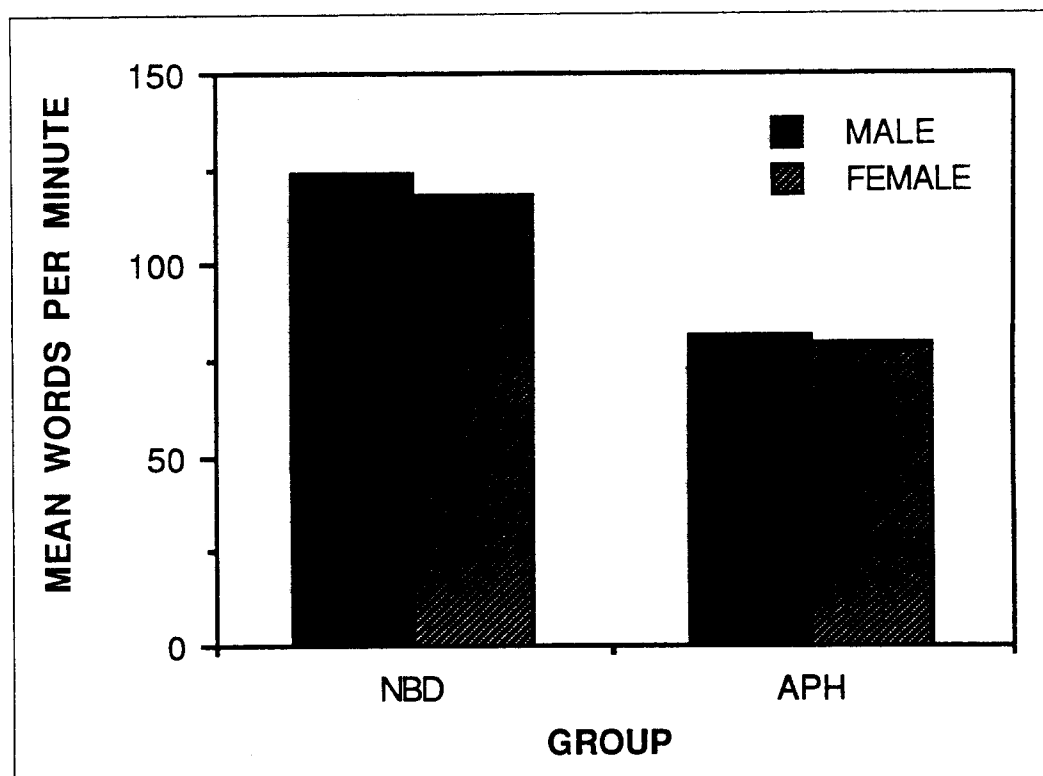


Figure 32-6. Speech rate for males versus females by group.

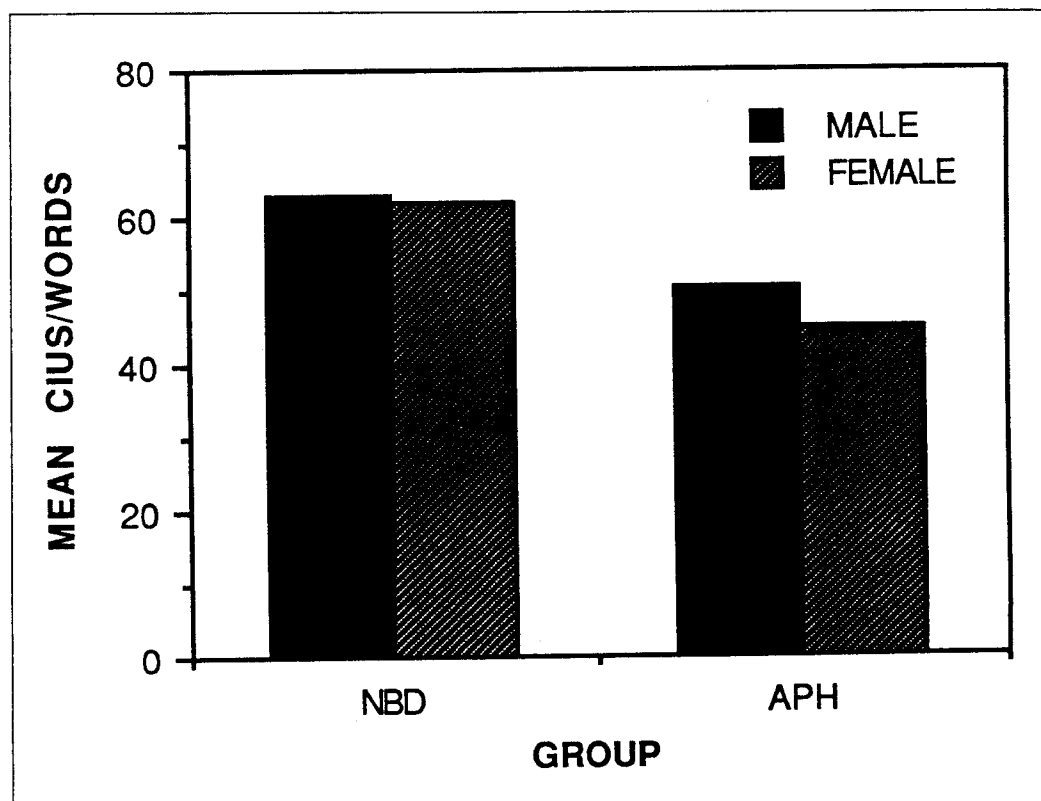


Figure 32-7. Information ratios produced for female- versus male-biased pictures.

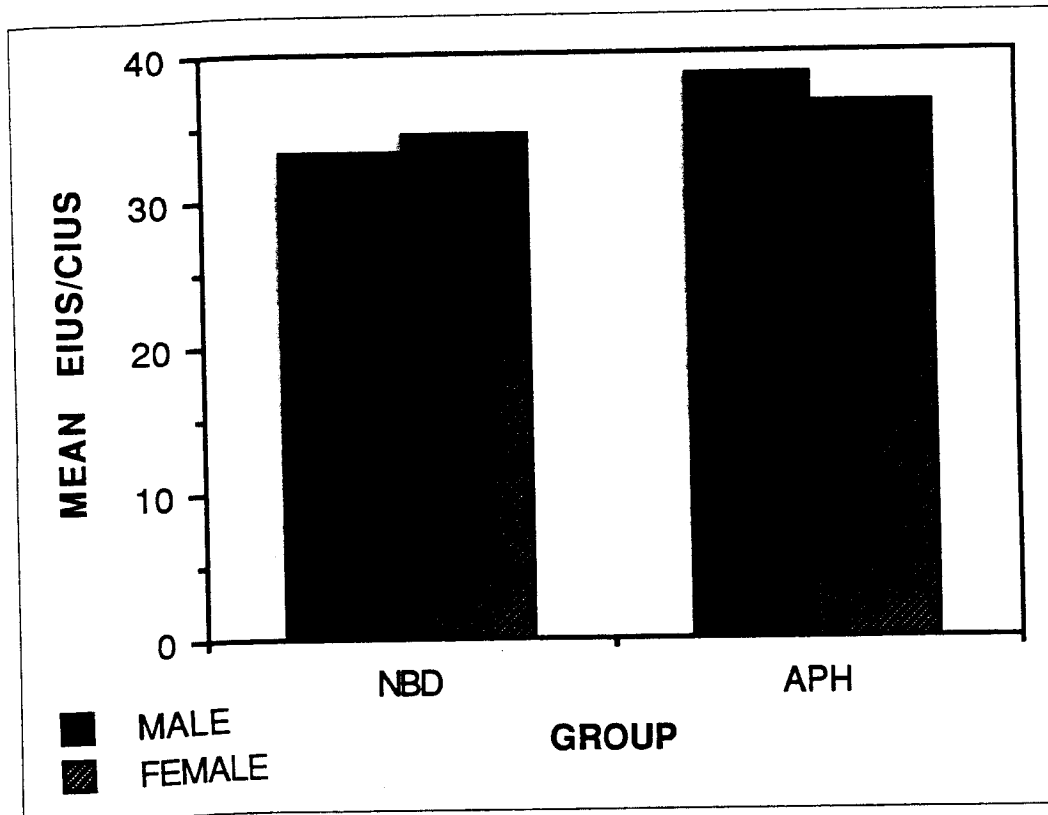


Figure 32-8. Effects of gender bias on amount of enumeration.

tures, because that was not a question addressed in this study, and it will not be addressed here. Notice, however, that the Rockwell pictures yielded results more like those generated by the BDAE picture than the MTDDA or WAB pictures. Aphasic and non-brain-damaged subjects were affected similarly by the three aphasia test pictures. The WAB picture elicited significantly more words than the BDAE or MTDDA pictures (Fig. 32-9). Both groups produced statistically significantly fewer words per minute for the WAB picture than for the BDAE and MTDDA pictures (Fig. 32-10). Both groups produced slightly but statistically significantly less efficient descriptions in response to the WAB picture than to the MTDDA and BDAE pictures (Fig. 32-11). Both groups produced statistically significantly more enumerative descriptions for the MTDDA and WAB pictures than for the BDAE picture (Fig. 32-12).

There was striking *qualitative* consistency between the performance of our non-brain-damaged and aphasic subjects. In none of our analyses did we find that differences among pictures depended on whether subjects were aphasic or non-brain-damaged.

We did find *quantitative* differences between non-brain-damaged and aphasic subjects on measures of rate and efficiency. Non-brain-damaged subjects talked faster, on the average, and conveyed more information per

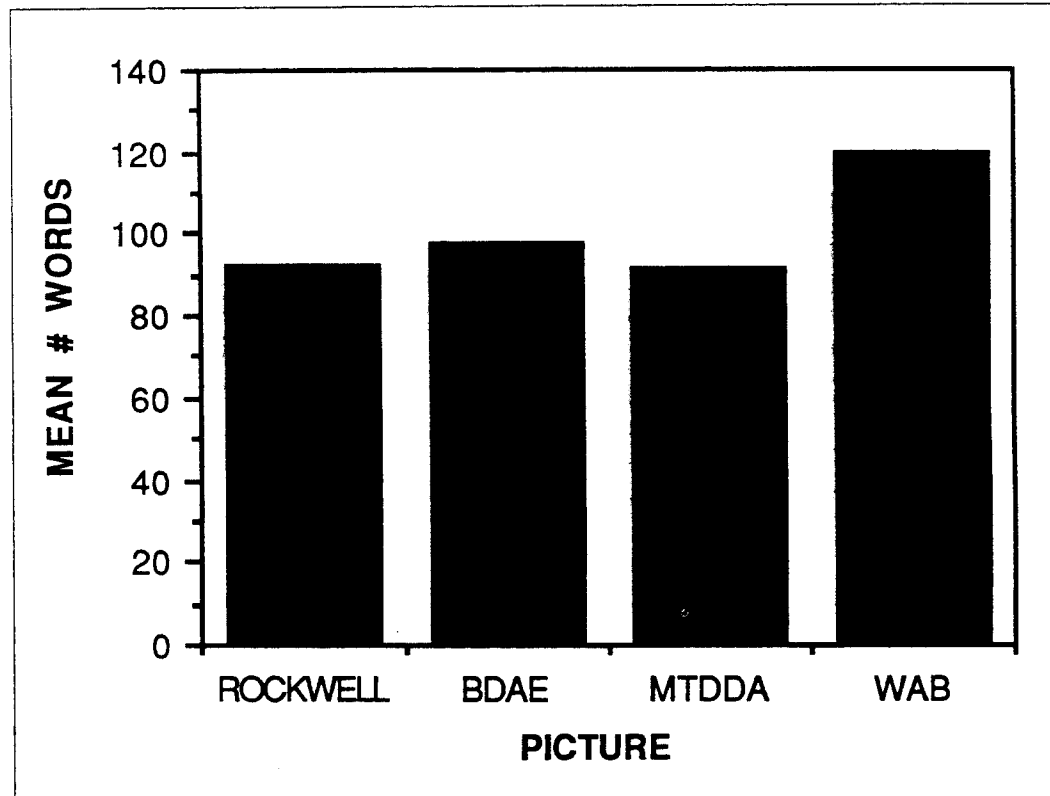


Figure 32-9. Mean number of words elicited by test.

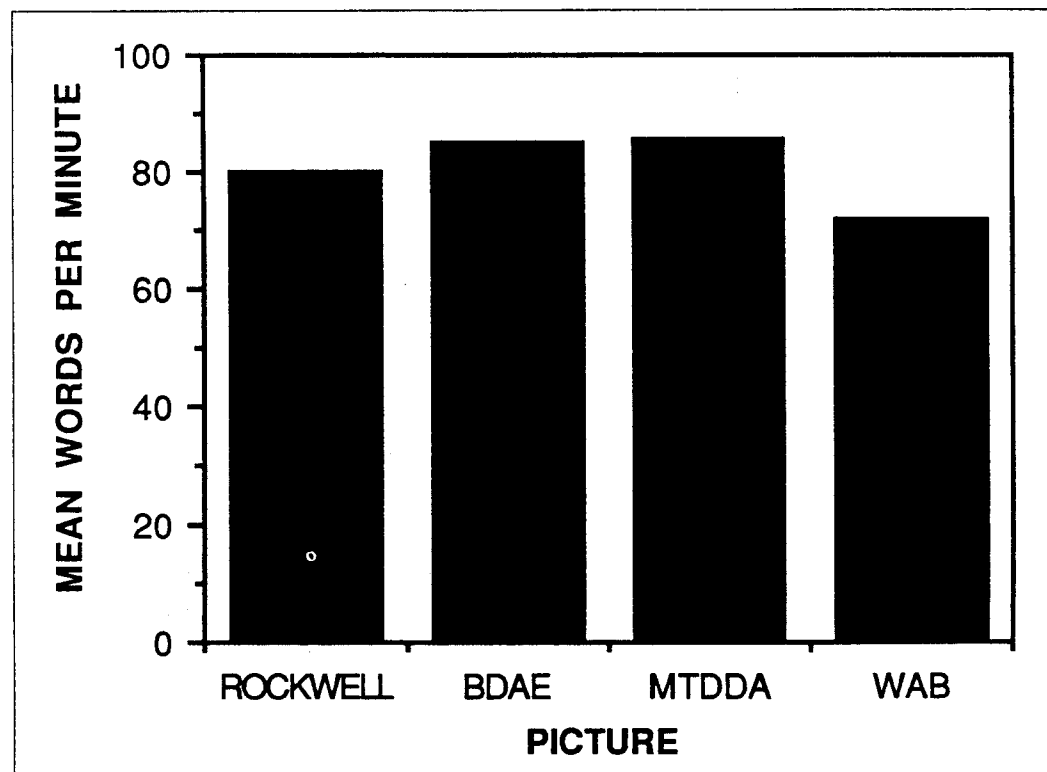


Figure 32-10. Mean number of words per minute produced by test.

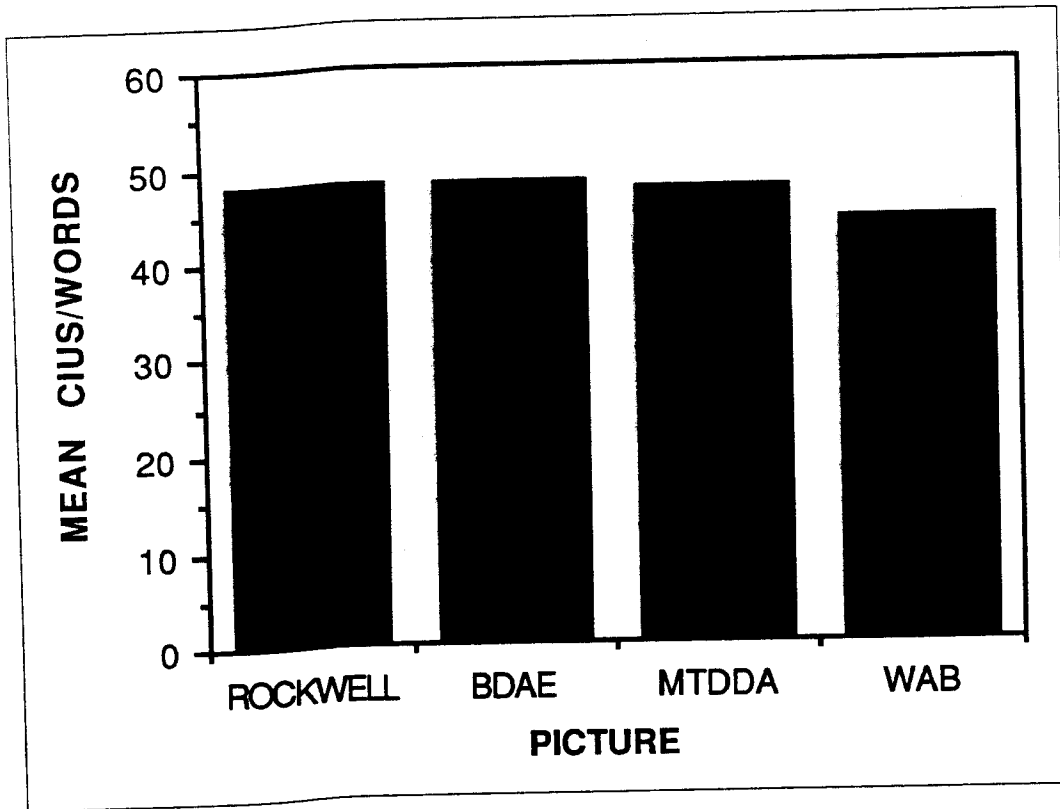


Figure 32-11. Efficiency of responses produced by test.

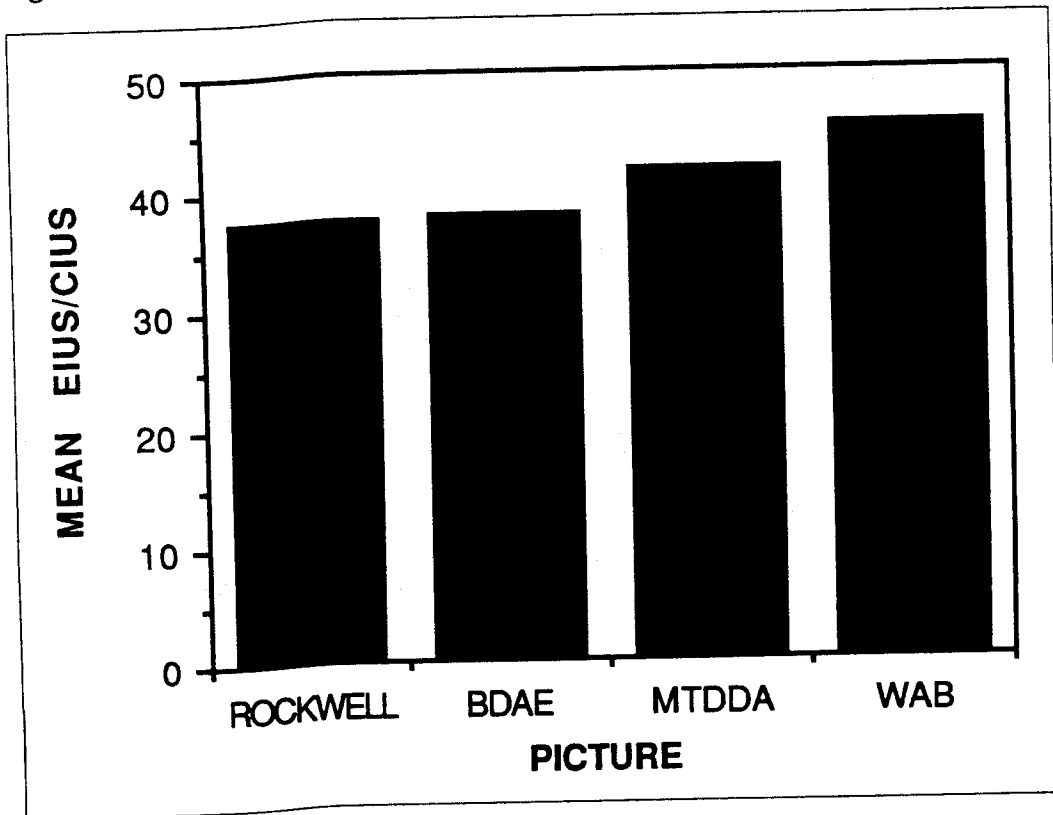


Figure 32-12. Enumerative descriptions produced by test.

unit of time than did aphasic subjects. These results are consistent with those of other investigators, such as Yorkston and Beukelman (1980), who have reported that efficiency in communicating information is more strongly compromised by aphasia than the amount of information conveyed.

The gender bias of pictures affected the *amount* that was said about them. Our subjects (who were male) said more words in response to our male-biased pictures than in response to our female-biased pictures. However, the *efficiency* with which they conveyed information and the *amount of information* they conveyed were not significantly affected by whether pictures were male biased or female biased. These results suggest that clinicians need not be greatly concerned about the potential effects of gender bias on speech samples elicited by pictures, unless the number of words produced is important.

Our speculation that the pictures from the MTDDA and the WAB might be conducive to naming was confirmed by our results. Both non-brain-damaged and aphasic subjects' descriptions of the WAB and MTDDA pictures contained more enumeration than their descriptions of the BDAE pictures. The WAB picture was the most conducive to enumeration, being significantly more so than either the MDTTA or the BDAE pictures.

It seems to us that the WAB picture elicited more words than the other two because there were more things in it to talk about, especially if one is predisposed to name. To test this speculation, several hospital staff members were asked to name all the things in each picture. Responses were restricted to single nouns. The WAB picture generated an average of 29 names, the MTDDA picture 17, and the BDAE picture 17. The WAB picture does, in fact, contain more things to name. This may explain why it elicits more words than the other two aphasia test pictures.

The explanation for the WAB picture's tendency to elicit less efficient descriptions also may relate to its tendency to elicit enumeration. Enumerative utterances tend to have a low proportion of information. For example, the utterance "That is a dog" contains four words and two information units ("is" and "dog"). Utterances portraying action tend to have higher proportions of information. For example, the utterance "The woman is washing dishes" contains five words and four information units ("the woman is washing dishes"). Our informal examination of the transcripts in this study suggests that enumerative utterances tend to contain more non-information-bearing words than utterances describing activities.

Our results suggest that not all Normal Rockwell pictures are created equal. Males are likely to say more about pictures portraying male-oriented activities than they will say about pictures portraying female-oriented activities. It seems reasonable that the converse would be true for female speakers, but we cannot be certain of that. However, the amount of *information* conveyed is not likely to be much affected by the gender bias of the pictures used to elicit speech.

Our results also suggest that not all aphasia test pictures are created equal, although as George Orwell commented in *Animal Farm*, some are created more equal than others. If you ask people to talk about the WAB picture or the MTDDA picture, you are likely to get lots of names but not much action. If you ask them to talk about the BDAE picture, you will get fewer names and more action. Whether you will get a better story or a more cohesive speech sample from the BDAE picture than from the WAB or the MDTTA picture remains to be seen.

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## DISCUSSION

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

- Q.** When you were talking about correct information units, you gave an example in which these words counted. We generally don't count auxiliaries and copulas because they don't add new information. Why did you count them?
- A.** I can see why you might not count them as separate information units because they sort of tag along with the main verb. However, it's not quite true that auxiliaries don't carry information. For instance, if you say "is walking" versus "was walking," the auxiliaries are carrying information. We vacillated on which way to go with that, and we eventually decided that auxiliaries were information bearing words. It may be somewhat misleading to use the term *information units* with the system that we've been working with, because each word is looked at individually, so that we're not looking at "units" as they have sometimes been defined, for example, considering an auxiliary

plus its verb as a unit that stands on its own. It can also happen that a subject may get one element correct and another incorrect. We wanted to be able to give credit for those elements that were correct. What you would count depends on one's intent. If you wish to distill a sample down to the essence of information in it, you're likely to compromise your ability to preserve the essence of aphasic speech, because if you take out too much you take out much of what aphasic people do that makes them different. One of our problems in looking at aphasic people's connected speech is that the standard measures that are available (words per minute, information, cohesion) tend not to be very sensitive to aphasia in that aphasic and nonaphasic people tend to look pretty similar on them. Yet, if you look at the transcripts, they're very different. You can tell aphasic people's transcripts from nonaphasic people's transcripts, which suggests to me that we may have the wrong measures and also suggests to me that we'd better not distill it down too far or we're going to lose the aphasic part of the speech sample.

- Q. How much do you think the fact that the Boston test picture has what are sort of "accidents of daily living" helps to elicit a more conversational sample, as do some of the Rockwell pictures?
- A. One nice thing about the Boston test picture is that there's something there that gives people a reason for talking about it. Many of the pictures that are used to elicit speech from aphasic people don't go anywhere — there's no point to them. There's a difference between what I call "scripts" and "stories." A script is simply a sequence of events from daily life with nothing unusual in the sequence, for example, an uneventful trip to the supermarket. If you were to tell someone about such a trip, they would wonder about your sanity, your social skills, or both. But if there had been a robbery while you were at the supermarket, and you were to begin telling about it, you would not be thought unusual. I think that stories are likely to elicit different kinds of speech and different amounts of speech from both aphasic and nonaphasic people.
- C. I would like to make a comment on the difference in the nature of the Rockwell pictures and those in standardized tests. Rockwell pictures require something more difficult, an evaluative component, evaluation of what you see. This might create another dimension of difficulty, and some aphasic people might not be able to do it. They may restrict themselves only to listing the actions of the participants.
- C. We have done some work in which we had aphasic patients describe humorous and nonhumorous cartoons, and we found that there might have been a cognitive element operating. The ones that the

aphasic patients appreciated were slapstick type cartoons, where what you see is what you get, but if you had to do some interpretation or bring prior knowledge to it, they did not appreciate the cartoons as humor, nor did they give as much information about them.

- A. The ability to talk about inferred or implied activities and interrelationships is something that we haven't dealt with yet. That seems to be getting into the semantics of speech, and one of the problems with that is there aren't any good measures, at least that I know of, that would be appropriate for aphasic people. That's one huge unlooked-at component of aphasic speech, and that may be where there are striking differences between aphasic and nonaphasic speakers.
- Q. I'd like to ask you about your determination of a naming bias. You based that on total nouns plus adjectives divided by correct information units? It seems to me that one could name a verb. One could look at a picture and say "falling." Aphasic patients do that all the time. Are you comfortable with your measure, or do you think it might be more valid if you put some sort of a string restriction on the sample?
- A. I'm not uncomfortable with our measures in terms of the results. I don't think there's any doubt, from looking at the transcript, that aphasic people, were doing more outright naming to the Minnesota and the Ontario test pictures than to the Boston test picture. I don't think that what you described was an artifact that would change the results. However, I think that is something that might be worked into the definition, so that even the potential for such an artifact would be eliminated.
- Q. Do you think the fact that the speakers and listeners both had access to the picture changed the nature of the speakers' responses?
- A. The differences among test pictures were found in the same situation. Both speaker and listener had access to the picture. Consequently, the differences among test pictures could not be affected by whether or not speaker and listener both had access to the test pictures. Furthermore, we are just finishing a study of shared versus unshared conditions, and we're finding that whether or not speakers and listeners share such pictorial stimuli doesn't much affect the speech samples obtained.