

The Effectiveness of Comprehension-Enhancing Strategies
Employed by Spouses of Aphasic Patients

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Several recent studies have begun to focus attention on the nature of communicative interactions between aphasic individuals and their nonaphasic communication partners (Lubinski *et al.*, 1980; Newhoff *et al.*, 1982; Gurland *et al.*, 1982). In particular, Linebaugh, Pryor, and Margulies (1983) found that the spouses of aphasic individuals made a variety of modifications when describing pictures to their aphasic spouses when these descriptions were compared with descriptions to nonaphasic listeners. What could not be determined from that study was whether or not these modifications had any facilitating effects on the aphasic listeners' comprehension of the descriptions. The present investigation was undertaken to determine if modifications in verbal expression made by spouses of aphasic individuals have any positive effects on the aphasic individual's comprehension.

METHOD

Subjects. Subjects for this study were six aphasic patients and their spouses. Aphasic subjects ranged in time post onset from 3.5 to 10.5 years with a mean of 7.0 years. Their scores on the Auditory Comprehension Test for Sentences (Shewan, 1980) ranged from 9 to 18 with a mean of 14.5. All of the aphasic-spouse dyads had been married and living together for at least 3 years, except for one couple which had had almost daily contact for over 8 years prior to their marriage four months before their participation in the study.

Procedures. The spouses described 18 action pictures to their respective aphasic spouse and to a nonaphasic listener via a videotape system. The spouses and the listeners were otherwise separated visually and auditorially. Use of the video system allowed the spouses free choice of expressive modality while preserving a common presentation mode to the aphasic listeners. The 18 pictures were presented to both the spouses and the listeners with three foil pictures which differed minimally from the target picture (see Figure 1). All of these stimulus plates were modifications of response plates from the ACTS. The positions of the four pictures differed on the plates presented to the spouse and the listener. Following each description, noncontingent feedback regarding the listener's performance was relayed to the spouse by the examiners via closed-circuit telephones.

The aphasic subjects observed their spouse's descriptions of the stimuli as they were being recorded and pointed to which of the four pictures they thought was being described. At a different time, at least one week before or after viewing the descriptions made directly to them, the aphasic subjects viewed the descriptions to the nonaphasic listener. Different randomizations of the stimuli were used for the two sets of descriptions, and the order in which the aphasic-spouse dyads participated in the two conditions was counterbalanced.

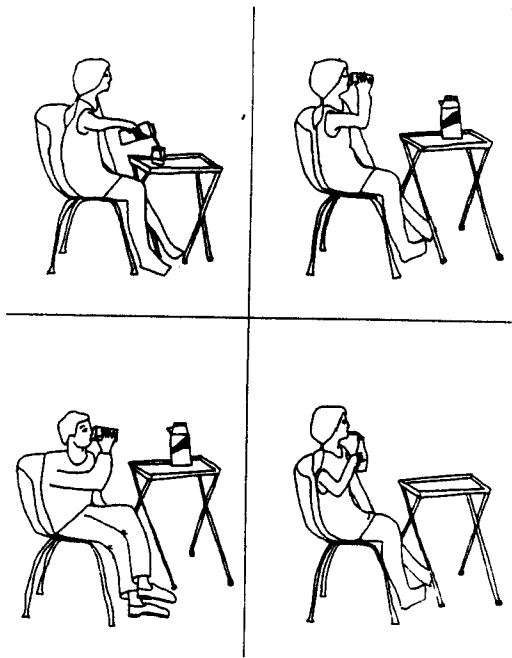


Figure 1. Sample stimulus plate.

RESULTS

Because the purpose of this study was to determine if the modifications in verbal expression made by individual spouses had any facilitatory effects on the auditory comprehension of their respective aphasic spouses, no group comparisons were conducted. Rather, the results were analyzed on a dyad-by-dyad basis.

Each description to both the aphasic and nonaphasic listeners was transcribed by one investigator and verified by a second. Several measures were derived for each description. These measures included: (1) number of words, (2) duration, (3) words per minute, (4) number of information unit types, (5) information unit types per minute, (6) number of redundant information units, (7) the ratio of stressed words to total words, and (8) the ratio of pauses to total words. Ratios were used for stressed words and pauses to adjust for differences in the length of descriptions to the aphasic and nonaphasic listeners.

The operational definition for information units used in this study is given in Appendix A. The examples cited are with reference to Figure 1. The first definition given is for Information Unit Type. Note that information unit is defined within the context of the experimental task in that only units of meaning which served to differentiate the target picture from the foils were considered information. Thus "girl," "pouring," and "doesn't have on any shoes" were considered information units, but "sitting" and "tray table" were not. The second definition is for Redundant Information Units.

Interjudge reliability was assessed for the duration of each description and numbers of information unit types, redundant information units, stressed

words, and pauses in each description. One investigator timed all 12 sets of descriptions, and a second investigator timed 6 sets. Their times were within .2 seconds on 89.8% of the descriptions both timed. None of the differences exceeded .4 seconds. Two investigators contributed to the counts of information unit types, redundant information units, stressed words, and pauses. Both performed these counts on 3 randomly selected descriptions to the aphasic and nonaphasic listener for each speaker. The two investigators achieved identical counts on 98.6% of the 36 descriptions for information unit types, 100% for redundant information units, and 92.8% for both stressed words and pauses.

The mean values for all 8 measures were derived for each set of descriptions. Those for the descriptions to the aphasic listeners were compared with those for the nonaphasic listeners on a subject-by-subject basis using t tests for correlated means. These mean values and the t test results are given in Table 1.

Two of the aphasic subjects, numbers 1 and 3, made fewer errors on the descriptions made directly to them than on those made to the nonaphasic listener (Table 2). As shown in Table 1, Spouse 1 made significant modifications on 7 of the 8 measures. This spouse spoke at a slower rate and used more pauses when speaking to the aphasic listener. She also presented more information unit types at a slower rate and used more redundant information units. In addition, this spouse frequently used her husband's name to focus attention and the phrases "like me" and "like you" to reiterate gender. She also employed meaningful gestures, tag questions, and an elimination strategy. This aphasic subject presented the most severe auditory comprehension deficit among the subjects in this study. Even with the extensive modifications made by his spouse, he responded inaccurately on 4 of the descriptions made directly to him.

Spouse 3 made significant modifications on only two of the measures. This spouse stressed more words and inserted more pauses when speaking to the aphasic listener. An additional modification which was observed was a reduction in normal dysfluencies when describing the pictures to the aphasic listener. This spouse exhibited only 4 dysfluencies when speaking to her aphasic husband, but 43 dysfluencies when speaking to the nonaphasic listener.

The remaining 4 aphasic listeners performed with essentially equal accuracy on both sets of descriptions, with none of these listeners making more than 2 errors on either set (see Table 2). Nonetheless, the spouses of two of these subjects made several modifications in their verbal expression.

Spouse 2 spoke to the aphasic listener at a rate barely half that at which she spoke to the nonaphasic listener and presented new information at a markedly reduced rate as well. This spouse also used more redundant information units, more stressed words, and more pauses when speaking to the aphasic listener. She also used Amerind gestures to reiterate gender and certain actions.

Spouse 4, whose husband performed flawlessly on both sets of descriptions, reduced the rate at which she presented new information to the aphasic listener. She also used a starter phrase on 17 of the 18 descriptions to him. Unexpectedly, this spouse also made a modification when speaking to the nonaphasic listener, stressing significantly more words.

Finally, Spouses 5 and 6, whose aphasic wives each made only one error on one set of descriptions, made no significant modifications on any of the measures.

Table 1. Means (standard deviations) and significant differences between spouses' descriptions to aphasic and nonaphasic listeners.

	Aphasic	Nonaphasic	t	p <
Speaker 1				
Words per description	35.3 (11.67)	17.9 (6.19)	5.89	.001
Time per description (sec.)	19.4 (8.05)	6.9 (3.41)	6.81	.001
Words per minute	109.7 (32.58)	163.9 (43.14)	-4.28	.001
Information unit types per description	5.3 (1.36)	4.1 (1.08)	2.54	.03
Information unit types per minute	18.6 (7.20)	40.2 (11.40)	-8.30	.001
Redundant information units	5.0 (2.09)	1.0 (1.46)	6.80	.001
Ratio of stressed words to total words per description	20.5 (5.01)	17.9 (9.81)	0.99	n.s.
Ratio of pauses to total words per description	18.0 (4.53)	10.7 (7.15)	3.79	.001
Speaker 2				
Words per description	30.4 (9.06)	14.9 (4.44)	7.37	.001
Time per description (sec.)	18.3 (3.20)	6.0 (2.19)	14.21	.001
Words per minute	86.2 (29.36)	156.2 (37.70)	-5.31	.001
Information unit types per description	5.0 (1.61)	4.4 (1.62)	1.16	n.s.
Information unit types per minute	16.2 (4.20)	48.0 (18.60)	-7.44	.001
Redundant information units	7.2 (2.12)	1.9 (1.59)	9.00	.001
Ratio of stressed words to total words per description	35.8 (7.77)	18.1 (11.59)	4.15	.001
Ratio of pauses to total words per description	27.9 (7.53)	15.2 (8.16)	3.98	.001
Speaker 3				
Words per description	17.7 (7.15)	19.8 (8.03)	-0.90	n.s.
Time per description (sec.)	7.2 (3.56)	8.8 (4.19)	-1.54	n.s.
Words per minute	155.0 (41.68)	135.8 (31.96)	1.51	n.s.
Information unit types per description	3.5 (0.79)	3.5 (0.86)	0.00	n.s.
Information unit types per minute	36.0 (18.00)	31.2 (22.80)	0.89	n.s.

Table 1 (continued)

	<u>Aphasic</u>	<u>Nonaphasic</u>	<u>t</u>	<u>p <</u>
Speaker 3 (continued)				
Redundant information units	0.9 (1.51)	1.0 (1.24)	-0.15	n.s.
Ratio of stressed words to total words per description	30.7 (10.27)	16.4 (7.35)	5.19	.001
Ratio of pauses to total words per description	17.9 (7.89)	10.9 (5.58)	2.85	.001
Speaker 4				
Words per description	12.6 (8.37)	6.8 (3.74)	11.09	.001
Time per description (sec.)	5.1 (2.15)	3.0 (1.67)	7.31	.001
Words per minute	162.9 (48.14)	147.4 (62.96)	1.12	n.s.
Information unit types per description	3.4 (0.78)	2.9 (0.68)	3.34	.004
Information unit types per minute	47.4 (20.40)	71.4 (35.40)	-3.35	.004
Redundant information units	0.6 (0.86)	0.4 (0.85)	0.77	n.s.
Ratio of stressed words to total words per description	26.1 (9.24)	38.1 (16.66)	-3.41	.003
Ratio of pauses to total words per description	14.7 (8.20)	17.7 (12.12)	-0.88	n.s.
Speaker 5				
Words per description	26.6 (8.37)	27.3 (7.27)	-0.22	n.s.
Time per description (sec.)	10.0 (2.63)	9.8 (3.08)	0.18	n.s.
Words per minute	159.4 (26.83)	170.7 (29.14)	-1.71	n.s.
Information unit types per description	4.8 (1.38)	4.7 (1.27)	0.25	n.s.
Information unit types per minute	30.0 (8.40)	30.6 (8.40)	-0.29	n.s.
Redundant information units	2.1 (1.06)	2.1 (1.75)	-0.11	n.s.
Ratio of stressed words to total words per description	15.1 (5.06)	13.9 (4.40)	0.76	n.s.
Ratio of pauses to total words per description	9.2 (5.08)	7.1 (5.62)	1.52	n.s.

Table 1 (continued)

	<u>Aphasic</u>	<u>Nonaphasic</u>	<u>t</u>	<u>p <</u>
Speaker 6				
Words per description	15.5 (5.58)	18.1 (9.14)	-1.41	n.s.
Time per description (sec.)	5.8 (2.21)	6.6 (3.72)	-0.88	n.s.
Words per minute	163.8 (19.15)	177.9 (29.70)	-1.57	n.s.
Information unit types per description	4.1 (1.08)	4.4 (1.38)	-0.84	n.s.
Information unit types per minute	48.0 (18.00)	48.0 (18.00)	0.02	n.s.
Redundant information units	1.1 (1.06)	1.3 (1.81)	-0.47	n.s.
Ratio of stressed words to total words per description	8.4 (5.64)	6.9 (6.67)	0.84	n.s.
Ratio of pauses to total words per description	3.9 (4.50)	4.5 (4.24)	-0.37	n.s.

Table 2. Number of errors made by aphasic listeners on descriptions made directly to them and those made to nonaphasic listeners.

	Subject					
	1	2	3	4	5	6
Descriptions to aphasic listener	4	0	2	0	2	1
Descriptions to nonaphasic listener	7	1	6	0	2	0

DISCUSSION

The results of this study display three patterns of interaction between the aphasic listeners' performance and the presence or absence of modifications in the verbal expression of their respective spouses. The first pattern is one in which the aphasic listeners performed better on those descriptions which were made directly to them and contained modifications than on those without modifications made to nonaphasic listeners.

As noted above, Spouse 1 made modifications on 7 of the 8 measures. Slower rate of speech, redundancy of information, and increased use of pauses presumably facilitated this aphasic listener's comprehension. An appropriate goal of intervention, therefore, would be the reinforcement and possible refinement of comprehension-enhancing strategies being used by a patient's spouse.

Spouse 3 used more stressed words and pauses and decreased her number of dysfluencies when speaking to the aphasic listener. Broen (1972) has reported that adults significantly reduce their number of dysfluencies when

speaking to children. She suggested that dysfluencies interrupt the flow of information and distract the listener. Perhaps, then, the presence of dysfluencies in the descriptions to the nonaphasic listener exacerbated the aphasic subject's auditory comprehension difficulties. In view of this finding, it is suggested that an additional goal of intervention be the modification of verbal behaviors which may interfere with an aphasic patient's comprehension.

The second pattern, as demonstrated by dyad 2, is one in which the aphasic listener performed as well on the descriptions to the nonaphasic listener which contained no modifications as he did on those directed to him which contained extensive modifications. One possible explanation for this finding is that the spouse's modifications reflected difficulty she had experienced communicating with her aphasic husband on more difficult tasks. The aphasic listener's level of auditory comprehension, however, did not appear to warrant such radical modifications in verbal expression, at least not on the experimental task. Thus, it may be inferred that the modifications made by this spouse represent an overcompensation. Such unnecessary compensations not only reduce communicative efficiency, but may also lead to frustration and even resentment on the part of the aphasic patient. An appropriate goal of intervention, therefore, would be to adjust modifications to meet the demands of a specific task on an aphasic individual's comprehension.

The third pattern as seen in Subjects 5 and 6 is one in which the aphasic listeners performed equally well on both sets of descriptions and their spouses made no modifications. These spouses appear to have been well aware of their aphasic wives' level of auditory comprehension and to have structured their verbal expression accordingly.

Spouse 4 presents a special case. This spouse used the starter phrase noted above and also slowed the rate at which she presented new information when speaking directly to the aphasic listener. Both of these modifications could be expected to facilitate comprehension. This spouse also made a modification in her descriptions to the nonaphasic listener which may have facilitated her husband's comprehension of those descriptions as well. In this set of descriptions, she stressed significantly more words than she had in her descriptions to the aphasic listener. This aphasic listener's performance on the two sets of descriptions, therefore, may have been abetted by different modifications on each set.

One important issue which the results of the present study fail to address is the relative effectiveness of the modifications made by the spouses. Decreased rate of speech, semantic redundancy, sentential stress, and the insertion of interword and interphrase pauses have all been shown to facilitate comprehension by aphasic individuals. Decreased rate of information presentation, use of attention focusing devices, use of personal references, and use of gesture are also likely facilitators of auditory comprehension. But are all of these compensations equally effective? Moreover, are all of these modifications universally effective or are some patient-specific in their facilitating effects? The similarity between the modifications made by the spouses of our aphasic subjects and those made by parents speaking to their children lend further emphasis to this issue. Finally, what degree of precision is demanded for certain modifications to be effective? For example, must stress and pause be placed at certain points in an utterance to be facilitating? If they are not precisely placed are they ineffective, or perhaps even counterproductive? These questions beg further investigation.

Certain limitations of this investigation should also be acknowledged. These include the relatively small number of aphasic-spouse dyads and the lack of subjects with severe auditory comprehension deficits. In addition, none of the spouses had less than 3 years experience dealing with their aphasic spouses's auditory comprehension difficulties. A further limitation may be that the task employed may not have been of sufficient difficulty to tax the comprehension of all subjects. Finally, the provision of only indirect feedback regarding listener performance not only denied the spouses an opportunity to make on-line revisions in their verbal expression but may have induced them to make more extensive modifications than they would have under a direct feedback condition.

In spite of these limitations, the results of this study argue persuasively for assessing the communicative interaction between aphasic patients and their spouses and for training spouses to make patient-specific comprehension-enhancing modifications in their verbal input. That such modifications will yield greater communicative success is undeniable. That they may also yield important psychological and rehabilitative benefits is an enticing possibility.

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APPENDIX A

OPERATIONAL DEFINITION OF INFORMATION UNITS

INFORMATION UNIT TYPE:

a first occurrence of a word or phrase which conveyed one element of information to the listener and served to differentiate the target picture from at least one foil (e.g., girl, pouring, doesn't have on any shoes).¹

REDUNDANT INFORMATION UNIT:

a) a reiteration of a previously conveyed information unit type using the same or different words (e.g., she, no shoes).

- b) a word or phrase which shared semantic features with a previously stated word or phrase and did not contain additional features which further differentiated the target picture from a foil (e.g., drinking/consuming).
- c) a word or phrase which was a semantic feature of a previously stated word or phrase (e.g., girl/like Nancy).

¹Examples cited are with reference to Figure 1.

DISCUSSION

Q: Did you measure the severity of the patients' aphasia?

A: Because of the nature of the task, we looked at it specifically on the ACTS. The range was 9 to 18 with a mean of 14.5.

Q: Did you use any other objective language measurement, like an overall on the PICA or Boston Severity Ratings?

A: We used no such measure per se. The range went all the way from a moderate mixed aphasia (Subject 1) to a very mild aphasia with severe apraxia of speech (Subject 5). Subject 2 is very interesting to us, because his wife seemingly went bonkers on the task. He was severely apraxic and moderately aphasic, and we had taught him several Amerind gestures. His wife had picked up the gestures and started using them on an input side when it was inappropriate.

C: I think your question about whether or not the strategies used by the spouses are universal in their effect on the aphasic patient is a really excellent one. What I was intrigued by was the missing cell on your slide. That would be a description by the normal spouse to a nonfamiliar aphasic person, just to see how they overcompensate with somebody that they haven't had three years experience with.

Q: Did you look at the nature of the modifications in relation to the aphasic's comprehension severity?

A: No, not in the broad sense. We looked at it in terms of their comprehension of the descriptions. Aphasic 1, for example, made 7 errors on the descriptions his wife had made to a nonaphasic listener. He made only 4 errors on ones that were made directly to him. The ones to him contained extensive modifications; they were markedly different from the ones made to the nonaphasic listener. That's the dimension in which we looked at comprehension. We did not attempt to correlate their performance to some overall measure.

Q: What is your idea about why modifications are made by the spouses at all?

A: I think there is some perception that the aphasic spouse is having difficulty with auditory comprehension. Take, for example, Spouse 3 who had the marked difference in dysfluencies. We think that she was aware of her husband's comprehension problems, and that the reduction in dysfluencies is indicative of her having done more preplanning of what she was going to say, organized the information, and then produced it more fluently, as opposed to doing more on-line formulation when speaking to the normal listener. Why did spouses make the specific modifications they did? I would presume certain ones had been reinforced over time.

Q: How do you deal with this issue in clinical practice? Do you train partners in speaking to the aphasic person? Do you tend to give a list of suggestions as to how to talk?

A: No, we don't give a list. I believe that's courting disaster. That's what we were trying to get at when we talked about the effectiveness of various strategies and how precisely a strategy needs to be applied. I think everyone here would agree that misplaced pauses can be very disruptive. So we're very cautious about saying, use more pauses, use more stress, for fear that it's going to be overdone. What we try to do is probe our aphasic patients and find what specific strategies are facilitating for them and then very directly train the spouses in strategies. We've been advocating very strongly, through a series of workshops, the use of goal-directed intervention with frequent communication partners. We identify a productive strategy, set a behavioral objective, and train the spouse to that objective. Then we seek to transfer it from the clinic situation to the real world very systematically.

Q: Did you in fact train all of these spouses in specific techniques?

A: None of these spouses had been trained.