Methods of Communication Analysis used
in Family Interaction Therapy

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Family Interaction Therapy is a seven phase treatment model which can be utilized with treating aphasic patients. This model is presented in Table 1. The primary purpose of this type of therapy is to rapidly enable the patient to communicate effectively with his family at home and peers at work.

Table 1. Family Interaction Therapy Model.

Phase I	Baseline Assessment: Evaluation of the 5 components of communication disorder.
Phase II	Development of Treatment Plan: SO, patient and therapist determine goals of therapy, communicative contexts and general schema. (SO=significant other)
Phase III	Selection of Target Behaviors: Utilizing the results of the initial assessment to enable therapist, patient, and SO to determine specific behaviors for training.
Phase IV	Training Target Behavior: The SO is trained to reliably administer a home program designed to instate target behaviors.
Phase V	Training in Self Regulation: The patient assumes responsibility for independent management of each aspect of the training paradigm.
Phase VI	Transfer and Generalization: Patient incorporates newly acquired behavior in novel situations and expands his behavioral repertoire. SO measures these processes environmentally.
Phase VII	Post Evaluation: Patient, SO and therapist assess permanence and durability of behavior change and impact of intervention on patient's life system.

During the assessment phase of therapy the following five components of the communication disorder are evaluated:

Behavioral Ability: Evaluation of the successful and unsuccessful communicative strategies used by the patient in the clinic and outside environments.

Behavioral Ecology: Assessment of the antecedent and consequent events tangential to the patient's communicative act and the ambient environment in which the act occurs.

Involvement of Significant Others: Assessment of the patient's need and desire for Significant Other (SO) involvement, and the SO's willingness to participate.

Readiness for Self Change: Evaluation of the patient's coping strategies, defense mechanisms, self concept and self expectations.

Medical Status: An assessment of how a patient's chronic illness will affect his overall prognosis.

In Family Interaction Therapy, results of the assessment of the first three components are used to create a treatment plan. Because elements of the fourth component, such as self concept, coping, and defense mechanisms may change as the patient's abilities improve, pre and post measurements are taken. The fifth component—medical status including nature of the neurological damage—is considered during the diagnostic phase, but the information is not used to measure or change the patient's communicative behavior. In this paper two baseline measurements, 1) the Spontaneous Speech Sample (SSS) and 2) the Family Interaction Analysis (FIA) will be presented. These procedures for collecting and analyzing data can be utilized as baseline diagnostic measures, treatment progress probes, or as a part of the actual treatment.

THE SPONTANEOUS SPEECH SAMPLE

In order to evaluate a patient's communicative attempts, a rich source of baseline information may be obtained from a sample of his conversational speech. The Spontaneous Speech Sample (SSS) contains an arbitrary 25 utterances produced by the patient. It is scored in terms of mean length of utterance (MLU), communicative success (CS), and efficiency (EFF). The mean length of utterance (MLU) is tabulated by calculating the number of intelligible words in each response and dividing by the total number of responses (25). Communicative success (CS) is determined by the listener's ability to comprehend the patient's utterance and is scored as either 1) successful (S) meaning that the listener understood the patient's intent, 2) unsuccessful (U) meaning that the listener did not understand or 3) rejection (R) meaning that the patient rejected or refused to attempt an appropriate communication exchange. Efficiency is an evaluation of whether the utterance is 1) abnormally short or constrained (scored as "+" efficiency), 2) appropriate (scored as "OK") or 3) abnormally excessive or redundant (scored as "-" efficiency).

As shown in Table 2, the first utterance "want water" was successful in terms of communicating semantic intent. In other words, the listener understood what the patient meant so the communicative success (CS) is scored "S" (successful). If this type of pattern persisted throughout the sample, a treatment plan designed to increase MLU might be appropriate. Sentence two is an example of an anomic patient searching for the word "water." The sentence is successful in terms of relaying the message (CS=S) but the MLU is excessively long (MLU=13) and the output is overly redundant or inefficient (EFF= -1). For this type of patient a treatment program designed to train self cueing strategies, self monitoring and sentence planning might be considered. Sentence three "I can't say it" is an example of communicative rejection. Although the patient is able to successfully communicate his idea efficiently, it is important to note the frequency of rejection statements throughout the sample to avoid misleading results.

Table 2. Spontaneous Speech Sample: Illustration of data collection and scoring procedure for a sample of a patient's utterance sample.

Data Collection Protocol

Utterance	MLU	CS	EFF
1. Want water	2	S U R	+ OK -
2. I want a - I want some - a glass of some - you know facet	13	S U R	+ OK -
3. I can't say it	4	S U R	+ OK -
. . .			
24. (Mickey Mackee Mickey Mackee)	-	S U R	+ OK -
25. I want some (megle merger) water	4	S U R	+ OK -

Scoring Examples

	Patient 1	Patient 2
MLU	14.6	3.1
% CS	20	70
% U	80	20
% R	0	10
% EFF +	0	75
% OK	20	25
% -	80	0

For example, a patient could produce a series of utterances in which he continued to reject communicative interaction. Theoretically each utterance could be normal in terms of length and efficiency and the message conveyed but qualitatively the patient is refusing to communicate. To avoid confusing this type of response with the positive ones, they are scored separately from successful or unsuccessful as rejections (R). Sentence 24 is an example of an unintelligible jargon-type response which is scored as communicatively unsuccessful: MLU and EFF are not scored because no intelligible words were uttered. If the patient were limited to this type of output, testing of this nature would be discontinued. In Sentence 25, the response is scored as successful because the desire for water is adequately communicated. The MLU is scored as 4.0 because only intelligible words are counted in this tabulation. The unintelligible attempts at the word are considered when scoring efficiency (EFF = -) because the patient's output is slowed down. If this type of pattern predominantly characterized the sample, a treatment plan designed to increase self monitoring and motor speech ability might be prescribed.

After the patient has produced 25 utterances, the profile of the patient's behavior is evaluated. Often the average utterance length, and

the percent of successful and efficient utterances are useful quantitative measures when attempting to study the nature of the sample. For example, the data summary shown in Table 2 may reflect the overall picture of each patient's communication. Patient One's scores suggest that he produced responses which were excessively long, inefficient and unsuccessful. However, Patient Two's scores describe output which was characterized by short, abnormally efficient utterances which for the most part were successful. Other dimensions of communication, such as gestures, prosody and writing were not scored on the spontaneous speech sample as presented. Based on the therapist wholistic evaluation of the patient's presenting behavior, the response definitions, scoring categories and criteria can be modified to gain appropriate information.

One of the advantages of this type of measure is that it is easy to use. In the clinic, the therapist may obtain an initial SSS to gain an understanding of the patient's disorder within the actual communicative context. From this experience the therapist quickly gains an idea of the patient's receptive-expressive language ability, motor speech difficulty, attention and memory. Further the therapist has the opportunity to observe the patient's baseline strategies for attempting to convey meaning or his response to communicative stimuli. To more fully understand the problem, however, the therapist may ask the patient and/or a Significant Other (SO) to tape record an SSS at home. The patient and SO are asked to consider their talking day and rank order the communicative oppor- tunities in terms of importance. Together with the therapist an initial context is selected for collection of the SSS. An example reported by one patient and SO was that prior to the stroke, they enjoyed having a cocktail together each evening while discussing the events of the day. When considering the nature of their typical days, they agreed that this context would be best for the SSS. In making this decision, they con- sidered time of the day, relative importance and regularity of this communicative exchange, and the varied nature of the conversational topics which could be utilized. The patient and the SO were instructed to tape record the verbal interaction, tallying the number of patient res- ponses until 25 had been produced. The patient or SO was asked to listen to the recording and transcribe each utterance on an SSS scoring form. The analysis of the SSS (scoring of the communicative success, mean length of utterance and efficiency) may be undertaken by the therapist, the SO and/or the patient. The scoring of the sample is not difficult; we have trained a number of aphasic patients to score their own SSSs on-line or from a tape recording. The results of the baseline SSS can be used to understand the nature of the problem in both home and clinical environments. A home sample provides the therapist with the notion of the nature of the patient's communicative opportunities and the natural environment in which they occur. The data analysis can be used to focus patient and SO on communicative success and the effectiveness of strategies utilized. If the patient scores his own sample he will begin to attend to or monitor his own behaviors. Generally we take normal speech so much for granted that even the slightest deviation from normal may stand out in an exag- gerated way. However, very often, even though the patient may be communi- cating in a very unusual fashion, he is able to convey his meaning. Involving the SO and the patient in this initial data collection may help to emphasize the patient's positive communicative ability rather than

dwelling on each error. As a result, the SO may automatically begin to change her behavior in ways which facilitate the patient's success.

In addition to using the SSS as a baseline measure, it can also be used as progress probe or as a content protocol for treatment. For example, if at baseline a patient's SSS revealed that the patient was successful only 20% of the time due to a high frequency of apraxic errors and short utterance length, a treatment program could be implemented for an arbritrary number of sessions and then readministration of the SSS could be undertaken to measure progress (change in MLU, EFF and CSS). Probes, taken in out-of-clinic environments, can be used to assess transfer and generalization. Secondly, the SSS itself could be used as the content for treatment. For example, the patient who is overly redundant could be taught to self monitor, evaluating his own utterance length, his communicative success, and his efficiency, following each sentence he says. This self regulatory training should result in the patient's improved ability to self monitor and self evaluate as he speaks.

THE FAMILY INTERACTION ANALYSIS

The Family Interaction Analysis is a measure used to study the relationship between the communication behaviors of the patient and SO. When normal speakers interact, the behavior of the listener may have a profound effect on the subsequent speaker behavior. For the stroke patient and the SO, communication difficulty is generally thrust upon them very suddenly. The SO is forced to attempt self-created strategies (usually automatic ones) which the SO hopes will help the patient or at least reduce the SO's own frustration. These types of SO behaviors often include speaking in a loud voice, repeating, guessing, using very simple sentences, requiring one-word responses and so forth. These SO behaviors could actually limit the patient's chances for successful output or embarrass the patient to the point of communicative withdrawal. Thus, the purpose of this baseline measure is to examine how the SO's behavior may affect the communicative success of the patient.

For example, as shown in Table 3 Item I, the SO produced a "4" behavior or an open question such as "what shall we do today?" and the patient responded with "don't know nothing"—a rejection response. If rejections constantly followed open questions, the SO could be trained to provide stimuli which are more limiting in nature and might provide the patient with greater chance for successful interaction, such as "would you like to go to the movies or watch TV or play golf today?". In the second example, the patient said "I don't want to go" and the SO replied "because . . ." to which the patient stated "because I don't feel well." Minimal encouragers may be helpful as a gentle, non-threatening, cueing strategy for the SO to use without embarrassing the patient. Thirdly, in response to a closed question such as "what time is it?", the patient was unable to respond successfully. For the apraxic patient, stimuli which limit output possibilities may lessen the patient's chance for success. In the next example, the patient's response was hostile— the patient said "shut up" after the SO attempted to provide verbal hints (guessing) to help the patient produce the correct response. Finally in the last example, the patient exhibits jargon behavior in response to verbal following.

Table 3. Family Interaction Analysis: Illustration of data collection and scoring procedure for patient/SO interaction.

Data Collection Protocol

	SO	Patient response	CS
1.	4	don't know nothing	S U R
2.	2	because I don't feel well	S U R
3.	3	nata nicka noto can't	S U R
.			
.			
.			
49.	5	shut up	S U R
50.	1	some fricklenoose and ficklecee. .	S U R

Scoring Procedure

		% S	% U	% R
1.	Verbal Following	1111	11	
2.	Minimal Encouragers . .	1111 1111	0	
3.	Closed Questions		1111 1111	
4.	Open Questions	1		
5.	Verbal Cueing	.	0	1111

The purpose of the Family Interaction Analysis is to evaluate the interaction between the SO and the patient. Therefore, the scoring must take the behavior of each of them into account. In the example presented in Table 3, the patient's responses were evaluated in terms of communicatice success (CS). For another patient accurate comprehension or attention might be desired responses. Following completion of the sample, a tally is taken in order to analyze the SO/patient behavioral relationship. As shown in the scoring example, in response to verbal following the patient was successful 5 of 10 times; for minimal encouragers, the patient was successful 10 of 10 times, while closed questions resulted in 10 failures. Open questions did not occur enough to evaluate their effectiveness, while verbal cueing appeared continually to result in rejection 5 of 6 times. From this quantitative analysis the therapist, SO and patient may begin to form opinions about the strategies used by both the patient and the SO which result in successful communication.

The FIA can be used in the home as well as in the clinic. Following the procedure employed for the home SSS, we have instructed patients or SOs to make an audio tape recording of a home conversation or, in some instances, we have visited the home and made a video recording. After scoring the sample, we have obtained a baseline description of the behavioral ecology of the communication disorder, the SO behavior adjacent to the patient's speech act, and a notion of the patient's out-of-the clinic ability. Often we have found that some patients are significantly more successful at home than in the clinic, while others are markedly more limited at home. If it is noted that the patient generally succeeds or fails following particular SO behaviors, the SO can be trained to monitor and evaluate her own behavior to assist the patient in achieving success.

In some cases, it may be advisable to train the patient and the SO together, teaching them to note the successfulness of the interaction. For the SO who appears to need concommitant counseling or the patient who does not want the SO in his individual therapy, individual or group SO sessions may be more productive.

In summary both the SSS and the Family Interaction Analysis present several advantages, including:

1) each are simple measures to obtain,
2) each allows for easy transfer of training,
3) each focuses on positive aspects of communicative success,
4) they can serve as probes to evaluate and improve the treatment design,
5) they can be used as the content for treatment.

The dangers of using this type of diagnostic treatment approach relate to interrupting patient/SO dynamics. For example, the high self-reinforcer, who sees himself as in control of his environment, may resent involvement of the SO in therapy even to the point of engaging in nonproductive behaviors. As a result the patient may sabotage his own progress in an effort to maintain independence. Secondly, if the patient is not seen early post onset, he may develop low expectations for himself or inappropriate SO/patient interaction patterns may become conditioned and difficult to replace. Thus, intervening several months post onset may limit expectations. Third, if the patient has been involved in a drill-type therapy program in which he focused on his errors or the negative aspects of his output, it may be difficult to refocus him on the more wholistic aspects of communication. Often patients who have been instructed to spend time each day on workbook activities or exercises prefer not to engage in communication oriented activities. Perhaps, this is because the exercises can be done privately. The patient feels he is actively doing something about his problem without drawing attention to himself. Although his communication improvement may be difficult to perceive on a daily basis, he may believe that all will be better in the future. The Family Interaction approach requires that therapy become superimposed on a dialogue between people, which forces the patient to acknowledge and expose his problem. This direct attack on the communication act could be threatening for some patients. Further, once the SO is brought into direct therapy, a new level of accountability may be required of the therapist. However, the goal of all therapy is to assist the patient in developing adequate communication skills, so that he can exchange his thoughts and ideas with others and manage independently. It is difficult to conceptualize organizing a therapeutic experience that results in meeting these goals, if communicative transfer and generalization are not integrated into the treatment. Because these two baseline measures, the Spontaneous Speech Sample and the Family Interaction Analysis are designed to be used in the home at the time of the communicative interaction, the therapist, the SO and the patient are made to consider transfer and generalization from the beginning phase of intervention. As a result the subsequent treatment program may be organized not only to improve communication but will be environmentally relevant as well.

ACKNOWLEDGMENT

FAMILY INTERACTION ANALYSIS: Scoring Form

SO Behaviors

		S	U	R
1.	inattentive posture			
2.	incongruent affect			
3.	lengthy response			
4.	self focus			
5.	inappropriate topic change			
6.	advice giving			
7.	judgmental response			
8.	premature confrontation			
9.	interrupting			
10.	guessing			
11.	repeating			
12.	simple language			
13.	loud voice			
14.	abrupt topic change			
15.	speaking for patient			

Non-Facilitative

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16.	closed question			
17.	verbal following			
18.	minimal encouragers			
19.	open question			
20.	paraphrasing content			
21.	reflecting feeling			
22.	summarizing content			
23.	summarizing feeling			
24.	sharing			
25.	confrontation			
26.	interpretation			
27.	verbal cueing			
28.	gesturing			
29.	instruction			
30.	labeling			
31.	modeling			
32.	physical cue			
33.	request for attention			

Facilitative