In recent years, rehabilitation for persons with aphasia has focused increasingly on the activity/participation dimension (World Health Organization, 2001) of the consequences of aphasia including how the individual with aphasia interacts with others and psychosocial aspects of their adjustment to living with aphasia (Borenstein, Linell, & Wahrborg, 1987, Kagen & Gailey, 1993; Kagen, et al., 2001, Lyon, et al., 1997; Newhoff, Bugbee, & Ferriera, 1981; Rogers, Alarcon, & Olswang, 2000; Simmons, Kearns, & Potechin, 1987; Simmons-Makie, 1998). As much of this literature proposes, for individuals with moderate to severe aphasia, successful communicative interactions requires skill, and often training, on the part of the unimpaired communication partners. Training communication partners to facilitate or support conversation represents a highly positive trend in aphasia management. Programmatic treatments focusing on partner and family training in aphasia have included *Conversational Coaching* (Holland, 1991), *Family Member Training* (Simmons, Kearns, & Potechin, 1987), *Communication Partners* (Lyon, 1988)*, Supported Conversation for Adults with Aphasia* (SCA) (Kagan, 1998), and *Family Intervention for Chronic Aphasia* (FICA) (Rogers, Alarcon, & Olswang, 1999). Research concerning the efficacy of partner training has indicated that communication with the individual with aphasia can be improved by teaching communication partners strategies to facilitate communication, even if the person with aphasia does not participate in the training (Simmons, Kearns, & Potechin, 1987). Improvements have been observed among individuals with aphasia on measures of functional communication following intervention designed to improve communication with their spouses (Lyon et al., 1997; Wahrborg & Borenstein, 1989). The improvements observed with partner training suggest that 'good' communication partners can help *unmask* the underlying communicative competencies of the individual with aphasia by enabling them to communicate better than they can talk (Holland, 1991; Simmons-Makie & Damico, 1995).

Given promising indications that partner training is an efficacious and necessary component of treatment, especially for individuals with severe aphasia, more research in this area is needed to further develop treatment methods and evaluate the efficacy of these interventions. However, prior to investigating treatment efficacy, it is imperative that reliable and valid methods of quantifying the quality of communicative interactions be established so that changes due to treatment can be detected. Unfortunately, at present, neither operational definitions nor empirically derived inventories of what constitutes "good communication" among individuals with aphasia are available. Thus, the systematic study of social interaction, especially for the purposes of improving evaluation and treatment of individuals with aphasia, would be greatly advanced by the development of reliable and valid methodology capable of quantifying the quality of communication.

Methods

Each of the three methods used to quantify the quality of communication involved the use of a corpus of 24 conversations, collected during two types of conversation (aphasic-chosen and general conversational topics) from twelve dyads. The videotapes were made with the knowledge and consent of the participants during a single session. The dyads were instructed to first communicate about anything they would like to discuss, *general conversation*, and topics such as future plans, recent events, and household projects were provided as suggestions. After completing five-minutes of conversation, the unimpaired partner left the room while the experimenter assisted the individual with aphasia to choose a conversational topic. Subsequently, the partner returned and the second, *aphasic-chosen conversation* was videotaped. Paper, pens, and the communication notebook of the individual with aphasia were available to use during both conversations. Two-minute segments (minutes three and four) from each conversation were used for the analyses.

Participants

The group of dyads was comprised of twelve people with aphasia and their most frequent communication partner (spouse, partner, or sibling). To be included in the study, the person with aphasia needed to be at least six months post-onset of aphasia and demonstrate either moderate or severe aphasia. The twelve individuals with aphasia were divided into two groups based on the severity of aphasia as measured by the Western Aphasia Battery – Aphasia Quotient (WAB-AQ), (Kertesz, 1982) and the Shorten Version Token Test (SVTT), (DeRenzi & Faglioni, 1978). The first group consisted of three females and three males who demonstrated moderate aphasia. The second group included three females and three males with severe aphasia. Table 1 displays selected demographic information and test results for each of the twelve the dyads.

Perceptual Judgments Method

This method involved obtaining perceptual judgments from two groups of viewers (expert and naïve) concerning the overall quality of the conversation, the supportiveness of the unimpaired partner, and the effectiveness of the individual with aphasia as well as rank orderings of the dyads from *best to worst* communicators. The expert viewer group consisted of 20 speech-language pathologists (SLPs) who were currently working in clinical settings with caseloads that included individuals with aphasia and had at least five-years of experience with aphasia. The group of SLPs was comprised of three males and 17 females with average age of 37 years. The naïve viewer group consisted of 20 individuals who were age- and gender-matched to the participating SLPs (one male and nineteen females with an average age of 39 years as shown in Table 2). The naïve viewers were unfamiliar with the communication deficits of people with aphasia and were recruited from the general community via the posting of flyers.

Facilitation Ratio Method

Conversational behaviors of the typically-speaking communication partner were coded in terms of the incidence of facilitatory and nonfacilitatory behaviors (see Appendix A) observed in ten-second intervals. This analysis yielded a metric labeled the *Facilitation Ratio* that was calculated for each two-minute segment of the two conversation types produced by each dyad.

Conversational Symmetry Method

Conversational symmetry was investigated in terms of the following dependent variables: the duration of active contributions, the percent of active contributions relative to passive, the percent of positive and negative turn interruptions and turn-passing, and the percent of verbal-only, nonverbal only, and verbal plus nonverbal means of communication.

Results

A comparison between the perceptions of communication quality and the dyad's Facilitation Ratio was conducted to determine if the use of the indexed set of facilitatory and non-facilitatory conversational behaviors provides a socially valid means by which to measure the multidimensional factors that contribute to the success of communicative interactions between individuals with aphasia and their communication partners. The results of the conversational symmetry measures were compared to test the internal validity of the facilitation ratio as a measure of communication quality. The results can be viewed in tables 3-5 and figures 1-5. Measures of reliability were also conducted (not shown here) and demonstrated both strengths and weaknesses of these measures.

Discussion

Each method of quantifying the quality of communication in aphasia provides somewhat different information, but they also converge in agreement concerning which conversations were generally measured as better exemplars of good communication. By and large, expert and naïve viewers perceived the quality of communication among the aphasia dyads similarly despite differences with respect to their background knowledge of aphasia. Based on the limited sample in this investigation, the method that appears to be the most sensitive is the perceptual rating of overall quality.

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Table 1: Profiles of Conversation Dyads

Aphasic	Date of Birth	Date of Onset	WAB-AQ	SVTT	Partner
M1	Oct-32	Mar-93	85.7	33	HUSBAND
M2	Mar-24	Nov-96	75.4	19.5	WIFE
M3	Sep-36	Aug-98	75.6	20.5	HUSBAND
M4	Aug-44	Mar-94	82.4	24.5	PARTNER
M5	Jan-37	Apr-98	71.3	19	SISTER
M6	Oct-56	Feb-98	64.8	17.5	WIFE
		AVG SCORE	75.9	22.3	
		SD	7.5	5.7	
S1	Dec-21	Apr-98	18.8	8	HUSBAND
S2	Sep-23	Mar-97	21	15.5	WIFE
S3	Mar-42	Jun-97	19.4	5	HUSBAND
S4	Aug-40	Jan-98	39.4	16	PARTNER
S5	Mar-39	Jan-94	8.4	3	WIFE
S6	Dec-42	Mar-91	5	4	HUSBAND
		AVG SCORE	18.7	8.6	
		SD	12.1	5.8	

Note: M denotes dyads in the moderate severity group; S denotes dyads in the severe group;
WAB-AQ denotes the Aphasia Quotient for the Western Aphasia Battery;
SVTT denotes Shortened Version of the Token Test.

Table 2: Profiles of Expert and Naïve Viewers

Expert Viewers	Gender	Age	Naïve Viewers	Gender	Age
1	FEMALE	41	1	FEMALE	52
2	FEMALE	42	2	FEMALE	28
3	FEMALE	49	3	FEMALE	35
4	FEMALE	30	4	FEMALE	27
5	FEMALE	44	5	FEMALE	40
6	FEMALE	28	6	FEMALE	50
7	FEMALE	23	7	FEMALE	26
8	FEMALE	25	8	FEMALE	44
9	MALE	23	9	FEMALE	33
10	FEMALE	29	10	FEMALE	46
11	FEMALE	50	11	FEMALE	35
12	MALE	59	12	FEMALE	38
13	MALE	52	13	MALE	30
14	FEMALE	44	14	FEMALE	45
15	FEMALE	43	15	FEMALE	44
16	FEMALE	32	16	FEMALE	35
17	FEMALE	26	17	FEMALE	46
18	FEMALE	25	18	FEMALE	36
19	FEMALE	38	19	FEMALE	39
20	FEMALE	31	20	FEMALE	40
	Mean Age: 36.7			Mean Age: 38.9	

Table 3: Pearson Product-Moment Correlation Coefficients for the Comparison of Perceptual Judgments for Naïve and Expert Viewers

	Moderate	Severe
Overall Quality	r = 0.98	r = 0.95
Supportiveness	r = 0.51	r = 0.94
Effectiveness	r = 0.97	r = 0.94
Rank	r = 0.92	r = 0.97

Conclusion: Experts (SLPs) and naïve (untrained) individuals judge quality of communication among aphasia dyads similarly (exception supportiveness of partner in moderate dyads).

Table 4: Pearson Product-Moment Correlation Coefficients of Rank and Perceptual Ratings for Both Viewer Groups: Collapsed Across Aphasia Severity

	Naive Data			Expert Data	
	Aph Choice	Familiar		Aph Choice	Familiar
Overall Quality	0.95	0.81	Overall Quality	0.91	0.77
Supportiveness	0.64	0.59	Supportiveness	0.7	0.62
Effectiveness	0.7	0.67	Effectiveness	0.66	0.54

Conclusion: Overall Quality was highly correlated with Rank across both viewer & conversation types groups; Supportiveness & Effectiveness less correlated.

Table 5: Pearson Product-Moment Correlation Coefficients of Rank Order and Overall Quality with the Facilitation Ratio

Rank and Facilitation Ratio		
	Moderate	Severe
Naïve	-0.66	0.87
Expert	-0.35	0.79
Overall Quality and Facilitation Ratio		
	Moderate	Severe
Naïve	-0.6	0.86
Expert	-0.54	0.85

Conclusion: Correlations were high for severe aphasia dyads but low for moderate aphasia dyads suggesting that communication partners' behaviors (as measured by the Facilitation Ratio) is more important when judging communication quality in severe as opposed to moderate aphasia dyads.

Results of Conversational Symmetry Analyses

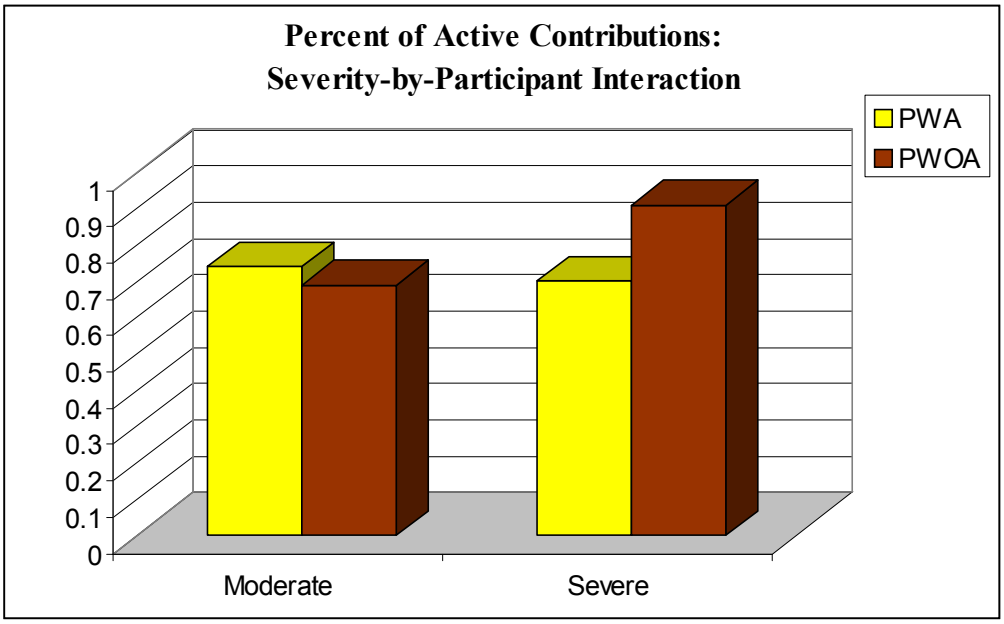

Figure 1. Person without aphasia (PWOA) communicating with persons with severe aphasia had significantly more active contributions than PWOAs communicating with persons with moderate aphasia. The moderate and severe persons with aphasia (PWA) exhibited comparable percentages of active contributions.

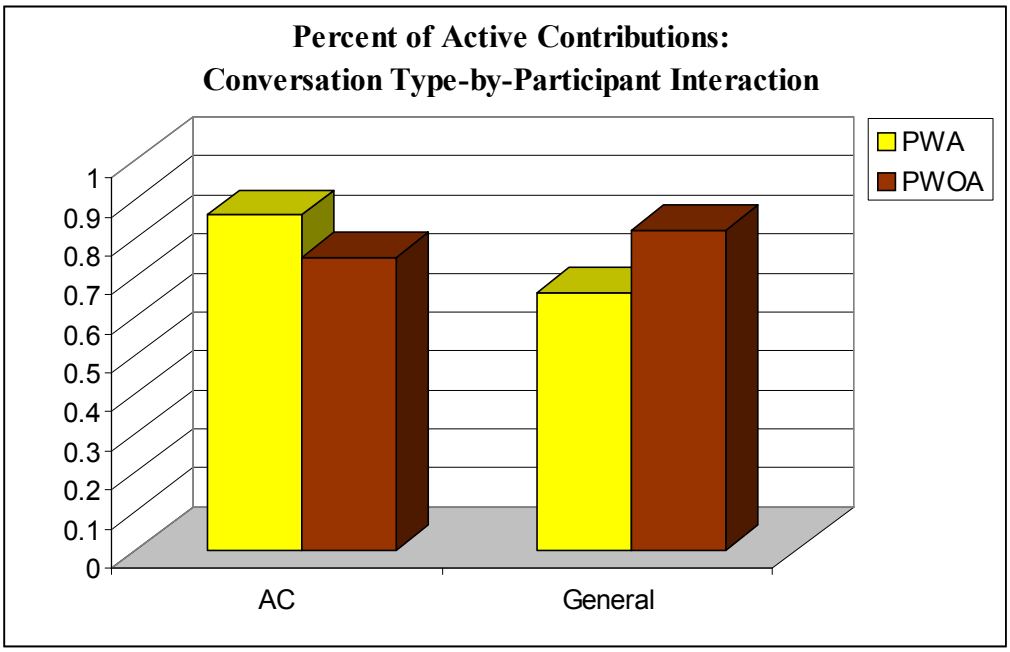

Figure 2. As a group, persons with aphasia (PWA) exhibited significantly more active contributions during aphasic-chosen than general conversations. As a group, persons without aphasia (PWOA) exhibited comparable percentages of active contributions during both types of conversation.

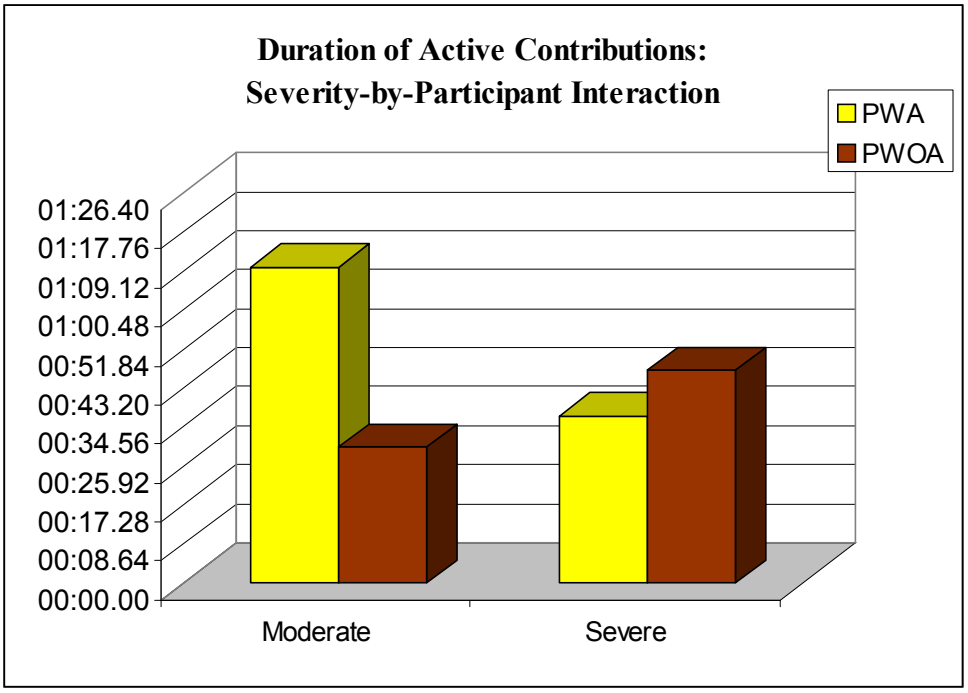

Figure 3. The moderately severe persons with aphasia (PWA) exhibited significantly longer active contributions than severe PWAs. As a group, persons without aphasia (PWOA) exhibited significantly longer active contributions when communicating with severe PWAs as compared to moderate PWAs.

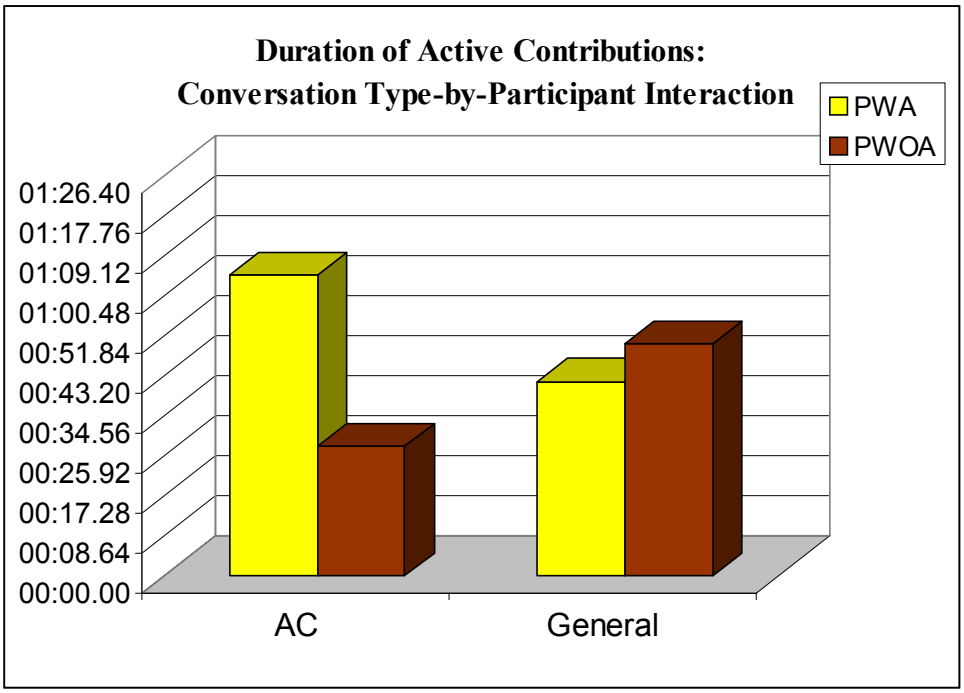

Figure 4. Persons with aphasia (PWA) exhibited significantly longer active contributions during aphasic-chosen (AC) conversations than during general conversations. Persons without aphasia (PWOA) exhibited significantly longer active contributions during general conversations than during aphasic-chosen conversations

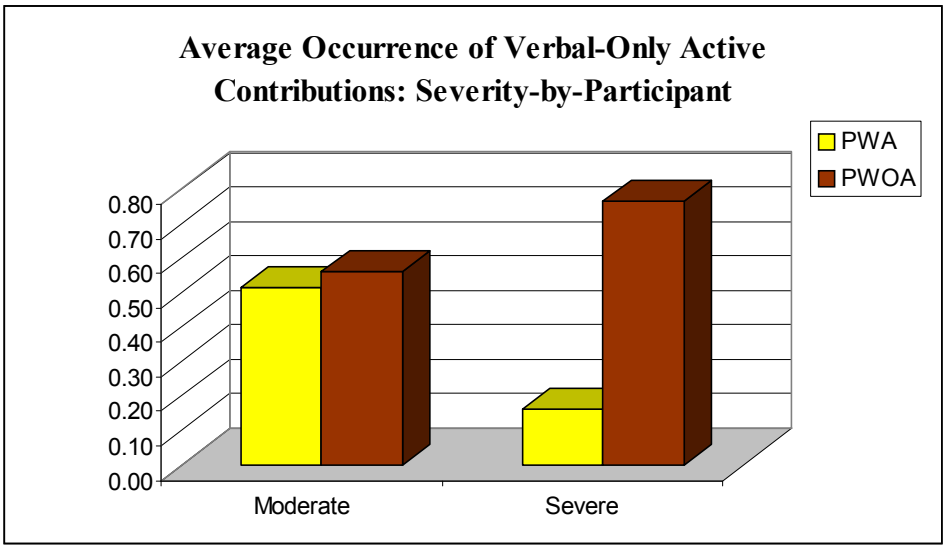

Figure 5. In dyads with a person with severe aphasia, the person without aphasia (PWOA) exhibited significantly more verbal-only active contributions than in dyads with moderate aphasia.

Appendix A. Table of Facilitory and Non-facilitory behaviors

FACILITORY	NON-FACILITORY
Communication Partner as *Speaker*:	
Obligatory Codes ***(behaviors always to be coded)***	
(A) MODALITY OF COMMUNICATION * (when appropriate: e.g., places, numbers, names, dates, key words, during a breakdown)	
1. Use of Multi-Modality Communication -drawing, referential gesture, writing, communication book, pointing -not including head nods and nonspecific gesture	2. Verbal Only -verbal repetition -lack of shift to alternate modality when appropriate
(B) EXTRALINGUISTICS	
1. Facilitory Extralinguistics -appropriate rate, tone, prosody	2. Nonfacilitory Extralinguistics -inappropriate: fast rate, harsh tone, "talking down," mumbling
Non-obligatory Codes:	
(C) CHECKING-IN	
1. Confirmation of Comprehension of person with Aphasia	**2. Communication w/o Confirmation of Comprehension of person with Aphasia**
(D) COMMENTING	
1. Facilitory Commenting -asking on-topic questions -on-topic opinions and remarks (new information)	2. Nonfacilitory Commenting -interrogation -continuous questioning w/o pausing -asking for known information -complex and/or overly lengthy sentence structure
(E) TOPIC INITIATION	
1. Appropriate Topic Initiation	**2. Abrupt Topic Changes; No Cues Regarding Main Idea or Topic**
Communication Partner as *Listener*	
Obligatory Codes:	
(F) LISTENING	

1. Attentive Listening
-affirming remarks/acknowledgements
-minimal encouragers
-appropriate social distance/proximity
-good eye contact/head nods

2. Inattentive Listening
-speaking for partner
-not yielding a turn
-interrupting/talking over person with aphasia's speech
-not acknowledging/ignoring
-insensitive to person with aphasia's cues
-inappropriate social distance/proximity/aggressive posture
-poor eye contact

Nonobligatory Codes:

(G) CUEING OF INDIVIDUAL WITH APHASIA

1. Cueing to Use Multi-Modality -e.g., "Could you draw something?"	2. Does Not Cue -request for information w/o cueing for multi-modality following a verbal-only breakdown

(H) REQUESTS FOR CLARIFICATION

1. Appropriate Clarifications/Confirmations of the Individual with Aphasia's Production -rephrasing for clarification -verification -specific requests -interpretation of verbal, gesture, drawing and written communication	2. Inappropriate Clarifications -request repetition for improved articulation -nonspecific request, "huh?"/ random guessing -limited, insufficient attempts to interpret verbal or multi-modality communication -literal interpretation of obvious paraphasia -failure to acknowledge misinformation or undecipherable messages

For Behavior A, Choose only #1 (facilitory) OR #2 (non-facilitory). Behaviors B through H may be coded as facilitory, non-facilitory, or both within one time segment.