**Abstract**
Most communication interactions are carried out at the discourse level. Clinically, it is important and ecologically valid to develop treatment protocols aimed at improving discourse ability in adults with aphasia. The purpose of this study was to investigate the effectiveness of scripting information components for narratives, one type of discourse ability, in adults with aphasia. This multiple probe design across participants and behaviors included two participants with Broca's aphasia and one with conduction aphasia. Data analyses indicated that the protocol was effective in increasing the amount of information relayed in response to picture stimuli.

**Introduction**
Most communication interactions are carried out at the discourse level. Clinically, it is important and ecologically valid to develop treatment protocols aimed at improving discourse ability in adults with aphasia. To quantify this ability, Capilouto, Wright, and Wagovich (2005) developed a main event measure focused on an individual's ability to convey the relationships and causal connections between ideas. The main event measure has been shown to be stable over time for healthy adults and adults with aphasia (Wright, Capilouto, Wagovich, Cranfill, & Davis, 2005).

The present study was undertaken as a preliminary investigation of the effectiveness of scripting information components for improving narrative production in adults with aphasia. The treatment protocol described here was developed in response to the Capilouto et al.'s (2005) research on narrative discourse and has some similarities with the clinical strategy Promoting Aphasics' Communicative Effectiveness (Wilcox & Davis, 1978). The present protocol used modern photographic images with a level of detail that encouraged production of complex sentences as well as multiple sentences resulting in a story-like quality.

**Methods**
Study participants included three adults diagnosed with aphasia; two males with Broca's aphasia and one female with conduction aphasia (Table 1). Criteria for inclusion in the study included: (1) aided or unaided visual acuity within normal limits, as indicated by passing a vision screening, (2) aided or unaided hearing acuity within normal limits, as indicated by passing a hearing screening, (3) at least three months post onset of the stroke, (4) mild to moderate severity of aphasia, and (5) negative history for cognitively deteriorating conditions such as Alzheimer's or Parkinson's.

Using the Core Vocabulary for Older Adults (CVOA; Retrieved July 21, 2005 from: http://aac.unl.edu), twenty target words expressing action were identified. The CVOA lists high frequency words taken from the spontaneous language samples of older adults insuring that any twenty words selected for treatment would be highly functional for daily communication. The selected targets were randomly divided into treated (10 words) and untreated (10 words) lists.

Baseline data were collected for both word lists to ensure stable performance across consecutive sessions prior to initiating treatment. Participants were presented each target picture, one at a time, and asked to explain what was happening in the picture (the explanation could include any or all of the pre-identified information components: who, is-doing, what, when, where, why). The clinicians were blinded to stimulus. Participants were encouraged to use any means of communication including verbal responses, written responses, gestures, and/or drawing. The examiner recorded the participants' responses indicating the response type. Following each session, the information components communicated were scored as correct or incorrect using a specially designed score sheet (Fig. 1). Baseline was followed by 6-8 treatment sessions. At the end of treatment a one-month follow-up session was completed to assess maintenance.

Each participant attended two treatment sessions per week for three to four weeks for a maximum of eight sessions. All sessions were audio and video recorded. During each treatment session, participants viewed the ten treated target pictures, in random order, and explained what was happening in each picture. Though the clinician did not know which picture was being shown, over time, they did become familiar with the stimuli. Following the participant's response, the picture was placed in the center of an information component board (Fig 2.). The examiner pointed to each component's visual cue, while simultaneously asking a 'who, is-doing, what, when, where, or why' question. Question order was random. Participants were reminded to use any means of communication including verbal responses, written responses, gestures, writing and/or drawing. Participants had 10 seconds to provide each component. If the participant did not provide a component or the response was incorrect or inappropriate, the examiner provided the correct answer. Once all of the components had been reviewed, the examiner provided a verbal recap of the entire picture description. Whenever possible, the examiner used the exact words provided by the participant.

Procedural reliability for the treatment and intra- and inter-rater agreement for information component (IC) counts were calculated. For procedural reliability, one videotaped session for each participant was rescored; procedural reliability was calculated to be 99.3%. Twenty percent of the sessions were rescored for intra- and inter-rater agreement for identifying information components; intra-rater agreement was 98% and inter-rater agreement was 97.6%.

**Results and Discussion**

Individual results are presented in Figures 3-5. Changes from baseline to treatment phases and baseline to maintenance phases were statistically analyzed via a time-series analysis using C-statistic (Suen & Ary, 1989; Tripodi, 1994; Tyron, 1982). Results of the data analysis are presented in Table 2.

For the treated list, all participants significantly increased the number of information components relayed during treatment compared to baseline performance. Moreover, for P1 and P2, narrative performance continued to improve significantly after treatment ended. However, only P2 maintained her performance significantly above baseline levels. Finally, performance gains appeared to generalize to the untreated list for P1 but not for P2 or P3.

While these results are preliminary, they suggest the protocol used here may be beneficial in improving the narrative discourse ability of individuals with aphasia. Participants' use of other communication methods will be presented and discussed, as well as, possible clinical presentations that may have contributed to each participants' performance.

**Table 1.** Description of participants at the time of treatment.

| Participant | Age | Years Post Stroke | Years of Education | Vocation | Aphasia Type | LQ from WAB |
|---|---|---|---|---|---|---|
| P1 | 64 | 4 | 9th Grade, GED | Retired farmer | Broca's | 48.9 |
| P2 | 74 | 3 | BA | Retired Marine | Broca's | 75.8 |
| P3 | 78 | 2 | MA | Retired teacher | Conduction | 68 |

**Table 2.** C-statistic analysis by participant.

| | Treated List | | | | | | | | | Untreated List | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baseline + Treatment | | | Baseline + Maintenance | | | Treatment + Maintenance | | | Baseline + Maintenance | | |
| Participant | C | z | *p* | C | z | *p* | C | z | *p* | C | z | *p* |
| P1 | 0.790 | 2.884 | 0.001 | 0.520 | 1.471 | 0.070 | 0.536 | 1.886 | 0.029 | 0.772 | 2.185 | 0.014 |
| P2 | 0.778 | 2.739 | 0.003 | 0.662 | 1.874 | 0.030 | 0.815 | 2.756 | 0.002 | 0.440 | 1.246 | 0.106 |
| P3 | 0.790 | 2.887 | 0.001 | -.243 | -.687 | 0.754 | 0.102 | 0.361 | 0.358 | 0.110 | 0.312 | 0.377 |

**Figure 1.** Response Score Sheet

**Treatment Score Sheet (complete for each session)**

Subject Initials: _____ Date: _______

Student Name:__________________ Treatment Session #: _______

| | WHO | Is-doing | WHAT | WHEN | WHERE | WHY | TOTAL |
|---|---|---|---|---|---|---|---|
| **1. Pix#** | | | | | | | |
| Transcription | | | | | | | |
| **2. Pix#** | | | | | | | |
| Transcription | | | | | | | |
| **3. Pix#** | | | | | | | |
| Transcription | | | | | | | |
| **4. Pix#** | | | | | | | |
| Transcription | | | | | | | |
| **5. Pix#** | | | | | | | |
| Transcription | | | | | | | |
| **6. Pix#** | | | | | | | |
| Transcription | | | | | | | |
| **7. Pix#** | | | | | | | |
| Transcription | | | | | | | |
| **8. Pix#** | | | | | | | |

Scoring symbols to use: **+** indicates correct response; **-** indicates incorrect response; **V** indicates response was verbal; **G** indicates response was a gesture; **W** indicates response was written; **D** indicates response was drawn

**Figure 2.** Information components board.

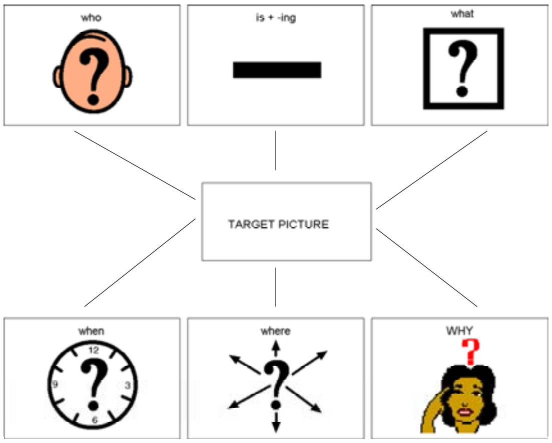



**Figure 3.** Performance results for P1.

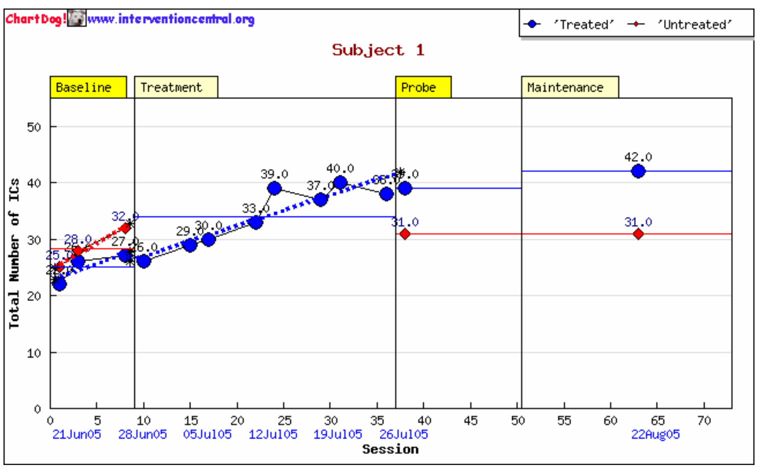



**Figure 4.** Performance results for P2.

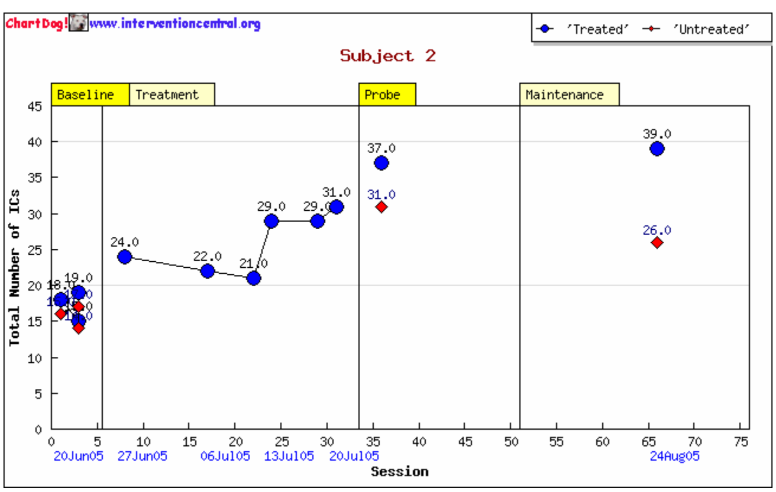
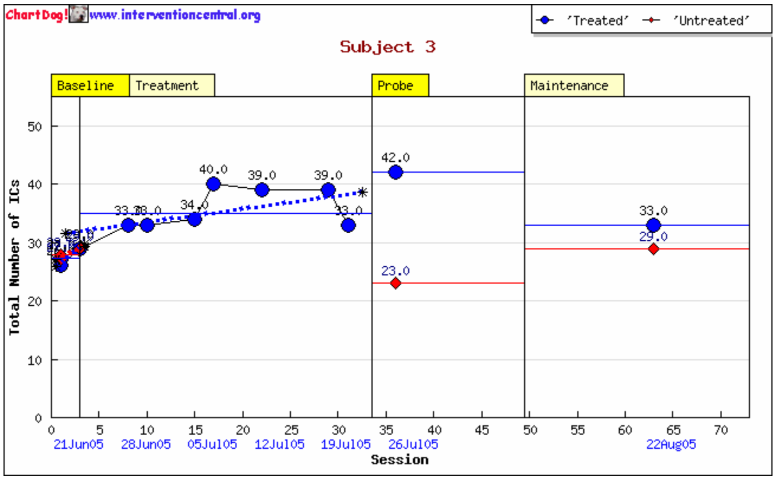


**Figure 5.** Performance results for P3.




## References


Capilouto, G., Wright, H.H. & Wagovich, S. (2005). CIU and main event analyses of the structured discourse of older and younger adults. *Journal of Communication Disroders, 38*, 263-273.

Suen, H., & Ary, D. (1989). *Analyzing quantitative behavioral observation data*. Hillsdale, NJ: Lawrence Erlbaum & Associates.

Tripodi, T. (1994). *A primer on single-subject design for clinical social workers*. Washington DC: NASW Press.

Tyron, W. W. (1982). A simplified time-series analysis for evaluating treatment interventions. *Journal of Applied Behavior Analysis*, *15*, 423-429.

Wilcox, J., & Davis, A. (1978). *Procedures for promoting communicative effectiveness in an aphasic adult.* Paper presented at the American Speech-Language-Hearing Association Annual Conference, San Francisco, CA.

Wright, H. H., Capilouto, G. J., Wagovich, S. A., Cranfill, T., & Davis, J. (2005). Development and reliability of a quantitative measure of adults' narratives. *Aphasiology, 19*(3/4/5), 263-273.