

Introduction

Since approximately 50% of people with aphasia experience incomplete restoration of language, augmentative and alternative communication (AAC) for people with aphasia has been used primarily as a compensatory therapeutic intervention. AAC is less frequently considered to restore linguistic functions (Weissling & Prentice 2010). Recently, researchers described the communication patterns used by people with aphasia when they retold personal narratives using four different AAC screen layouts (Dietz, Griffith, & Macke, 2014; Dietz, Weissling, Griffith, & McKelvey, 2014; Griffith, Dietz, & Weissling, 2014). Across these reports, the people with aphasia employed a variety of expressive modality units (i.e., spoken, written, drawn, picture, text box, and speak button) to retell their stories; however, they predominately used the spoken modality to retell each story. Despite the presence of an AAC device, they spoke, on average 70% of the time across all retells, (Dietz et al, 2014a; 2014b; Griffith et al., 2014). The question remains, though, whether these high levels of spoken output translates in to more effective and efficient verbal expression. Therefore, as such, the purpose of this retrospective case series study was to describe and analyze the spoken linguistic output of the people with aphasia and no prior AAC experience from the Dietz et al., (2014a; 2014b) studies.

Method

The participants of this retrospective study included three people with chronic aphasia: Randy, Phil, and Anne (see Table 1 for demographics). The researchers programmed four different co-constructed stories into the DynaVox *VMax*TM. These stories were randomly assigned to the following conditions: personally relevant (PR) photographs (1) with text boxes (PR + TB) and (2) without text boxes (PR - TB) as well as non-personally relevant (NPR) photographs (3) with text boxes (NPR + TB) and (4) without text boxes (NPR - TB) (see Figure 1). Each retell was recorded with two digital video cameras to capture gestures, the *VMax*TM screen and facial gestures. After a ten-minute device familiarization session, the people with aphasia had a brief ‘getting to know you’ interaction with the communication partner and then retold their four stories to her. Each story was transcribed, including all references to the device, gestures, written, and drawn communication into a Microsoft Word[®] document.

Transcriptions of spoken language were analyzed using the Systematic Analysis of Language Transcripts[®] (SALT) Software. SALT provides some automated language analyses, such as total different words (dWords) and allows for manual coding of other variables of interest, which included: (a) conversational units (C-Unit), or the segmentation of language into units consisting of each independent clause and dependent clauses (adapted from the t-unit: Hunt, 1965 and the communication unit: Loban, 1976) (b) correct information units (CIUs) or words that are “...intelligible in context, accurate in relation to the story, and are relevant to the topic or are informative about the content of the story.” (Nicholas & Brookshire, 1993, p. 348). Each story was edited to remove fillers, mazes, and unintelligible words. Interrater reliability checks revealed 90% reliability for coding of all variables.

Research Design

This study employed a case series design to isolate and describe the effect of four AAC interfaces on the spoken linguistic outcomes of each participant.

Results

Preliminary results reported are only those for Randy (see Table 2). Analyses are underway for Anne and Phil and will be completed by 4/30/14.

Total Talk Time

The PR - TB story, about Randy's trip to visit different Civil War battlefields, yielded the longest total talk time (24.79 minutes). The second longest story was the PR + TB narrative, which was about his annual vacation with his college friends (6.57 minutes). The two NPR narratives yielded the shortest talk time. Specifically, the NPR + TB story about his rehab efforts generated a total talk time of 4.37 minutes and the NPR - TB narrative about his surprise 50th birthday party, generated 3.30 minutes.

Percentage of dWords

Randy demonstrated the highest percentage of dWords during the NPR conditions during retell ($M = 43\%$, $Range = 38\% - 47\%$). He produced fewer dWords, on average during the PR retells ($M = 17\%$, $Range = 11\% - 23\%$).

Percentage of C-Units

Randy produced a higher percentage of C-Units during the retells without text boxes ($M = 46\%$, $Range = 42\% - 49\%$). In contrast, during retells with text boxes, he generated fewer percentage of C-Units ($M = 34\%$, $Range = 32\% - 35\%$).

C-Units per minute

Randy's average C-Units per minute was higher during the PR retells ($M = 3.74$, $Range = 3.67 - 3.81$) and only slightly lower, on average, during the NPR retells ($M = 3.43$, $Range = 2.52 - 4.33$),

Percentage CIUs

Randy's spoken expression included a higher percentage of CIUs during the NPR retells ($M = 36\%$, $Range = 32\% - 40\%$) when compared to the PR retells ($M = 28\%$, $Range = 27\% - 29\%$).

CIUs per minute

Randy produced the highest number of CIUs per minute during the NPR - TB condition (11.52). In contrast, he produced the lowest CIUs per minute during the NPR + TB (7.09) retell and comparable CIUs per minute during the PR + TB (9.74) and PR - TB (9.08) retells.

Discussion

These preliminary findings suggest that Randy produced more succinct retells during the PR retells when compared to the NPR + TB retell, as evidenced by the efficiency measures (i.e., C-Units per minute and CIUs per minute). However, during the NPR - TB retell, Randy appeared to produce the most superior spoken output, across nearly all measures. When interpreting this data, it is important to look at the total talk time of the story retells. Randy spent almost as much time telling the NPR stories combined as he did on the PR + TB story alone. Perhaps his seemingly less efficient linguistic performance in the PR conditions is due to the lengthier talk

times. The authors also learned, after the study, that Randy is a Civil War ‘buff;’ family reported that it is nearly impossible to get him to stop talking about this topic once he gets started. During this retell (PR - TB), Dietz et al., (2014b) also report that he spent a significant amount of time drawing maps to explain the location of specific battles, which led to significant numbers of breakdowns and paraphasias. In contrast, Randy did not demonstrate the same determination to share every detail during other three retells. It will be interesting to see whether Anne and Phil demonstrate the same trend for improved linguistic performance during the retell with the least support (i.e., NPR - TB). It is possible that AAC may bolster spoken language output for some people with aphasia and others may require instruction to use the supports to effectively support their spoken expression. However, given his interest level in the Civil War, perhaps the AAC device was not effective for Randy during the PR - TB retell because the right number and types of photographs and orthographic supports were not included in the system. Indeed, continued research is required to draw any conclusions regarding the impact of AAC on the spoken language performance of people with chronic aphasia.

References

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Table 1
Demographic and Language Measures

Participant	Age	Gender	Education Level	Ethnicity	Months Post Onset	High-Tech AAC Experience	WAB-R AQ^a	Aphasia Type
Randy	66	Male	Master's	Caucasian	71	No	60.7	TCM ^c
Phil	57	Male	Bachelors'	Caucasian	36	No	72.4	TCM
Anne	72	Female	Some College	Caucasian	252	No	61.1	Broca's [*]

^aWAB-R AQ = Western Aphasia Battery – Aphasia Quotient, maximum score = 100, ^bRCBA-2 = Reading Comprehension Battery for Aphasia, maximum score = 100, ^cTCM = Transcortical Motor, ^{*}Apraxia of Speech present.

Table 2

A summary of Randy's spoken language production during the four retell conditions

Measure	PR + TB ^a	PR - TB ^b	NPR + TB ^c	NPR - TB ^d
Total Talk Time	6.57 min	24.79min	4.37min	3.30min
% dWords	23%	11%	38%	47%
% C-Units ^e	35%	49%	32%	42%
C-Units/minute	3.81	3.67	2.52	4.33
% CIUs ^f	27%	29%	32%	40%
CIUs/minute	9.74	9.08	7.09	11.52

Note: ^a PR photographs with text boxes (PR + TB), ^b PR photographs without text boxes (PR - TB), ^c NPR photographs with text boxes (NPR + TB) and ^d NPR photographs without text boxes (NPR - TB), ^e C-Unit = Conversational Unit, ^f CIU = correct information units.

My niece Rian, was born January 12, 2012 at 11:59pm. ((S))

My sister was scared that her first child was going to be born on Friday, the 13th. ((S))

At 11:45 that night, she and her husband decided to have a C-section, to avoid the 13th. ((S))

Rian is now 22 months old and is an onry little girl. ((S))

Recently, she has just begun to talk, babbling aways and searching for those words. ((S))

I can't wait to spoil her rotten as she continues to grow! ((S))

jpg: © 2014 DynaVox™

Figure 1. *Example of AAC screen layout with personally relevant photos and text boxes. The non-personally relevant screens included Google Images that matched the PR photographs provided by the people with aphasia (as rated by 3 judges).* jpg: © 2014 DynaVox™