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Effects of familiarity and presentation mode on auditory-visual speech recognition in adults with aphasia

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Effects of familiarity and presentation mode on auditory-visual speech recognition in adults with aphasia

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Introduction

- Research demonstrates that adults with aphasia can continue improving their speech and language for years after their stroke with therapy.
- People with aphasia and their loved ones are searching for ways to continue speech and language improvements even after insurance runs out, and many are turning to technological therapy programs.
- There is little research on the skills people with aphasia need to benefit from these technological therapy programs. The current study reports on one of these skills, auditory visual speech perception.

Technological Therapy

Interest since 1992 — Petheram (1992, 2004)

Therapy programs focused on naming, sentences, conversational scripts. — Crerar et al. 1996, Linebarger et al. 2001, Mortley et al. 2001, Cherney et al. 2008, Abad et al. 2013; Palmer et al. 2012, Raymer et al. 2006; Laganaro et al. 2006; Fink et al. 2005; Doesborgh et al. 2004; Mortley et al. 2004

Lack of studies on the fundamental skills needed for these programs. — Choe and Stanton (2011)

Auditory Visual Speech Perception

- Maximize communication with visual cues Choe and Stanton 2011, Youse, Cienkowski, and Coelho (2004) Shindo, Kimitaka, and Tanaka (1991)
- Familiarity Flude, Ellis, and Kay (1989), Stimley and Noll (1994), and Dressler, Buder, and Cannito (2009)
- Presentation Mode (live v. recorded speech) Haley et al. (2011)

Participants

- Recruitment: Aphasia support groups in Indianapolis
- Number: 6 adults with aphasia
- Gender: 4 male, 2 female
- Age: 44-70 years old
- Cause: 5 from a stroke, 1 from infection
- Chronic Phase: 6 months to 6 years

Methods

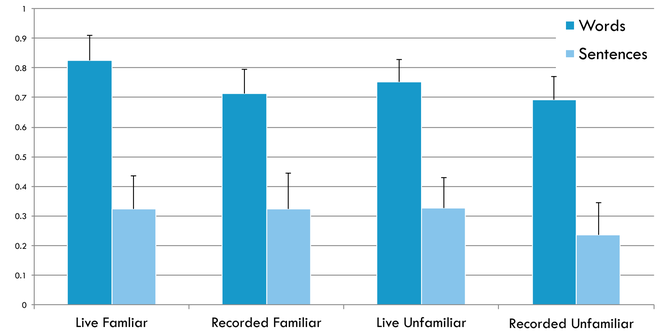
First Visit
Caregivers introduced to the study (informed consent) and videotaped speaking sentences.

Second Visit
Informed consent, Screening Tests Speech Recognition Tests

Screening Tests
History, vision, hearing, reaction time, short-term memory test, Western Aphasia Battery

	Live voice	Recorded voice
Familiar speaker (Caregiver)	Caregiver reads NU-6 words – Set A Caregiver reads CID sentences – Set A	Recording of caregiver reading NU-6 words – Set B Recording of caregiver reading CID sentences – Set B
Unfamiliar speaker (Researcher)	Researcher reads NU-6 words – Set C Researcher reads CID sentences – Set C	NU-6 words from Butler Auditory-Visual corpus – Set D (Richie, Warburton, and Carter 2009) CID sentences from Butler Auditory-Visual corpus –Set D (Richie, Warburton, and Carter 2009)

Results



	Significance (words)	Significance (sentences)
Familiarity	$p < 0.026$ *	$p < 0.498$
Presentation Mode	$p < 0.023$ *	$p < 0.003$ *

Significance: using a two-way repeated measures ANOVA, there is a relationship between the condition in which people with aphasia are presented speech and their performance on tests of speech recognition.

Results

		Live Familiar	Recorded Familiar	Live Unfamiliar	Recorded Unfamiliar
Visual Digit Span	Pearson Correlation	-0.095	-0.307	-0.179	-0.401
	Sig. (2-tailed)	0.858	0.554	0.735	0.431
Auditory Digit Span	Pearson Correlation	-0.873 *	-0.753	-0.8	-0.801
	Sig. (2-tailed)	0.023	0.084	0.056	0.055
WAB - R Repetition Score	Pearson Correlation	0.225	0.24	0.171	0.132
	Sig. (2-tailed)	0.669	0.647	0.746	0.803

Pearson's Correlation: In word tasks, only auditory digit span was correlated. In sentence tasks, there were significant correlations between repetition and performance in all four conditions. This high correlation was consistent, so it does not explain the differences between conditions.

Conclusions

- There is a statistically significant difference between the four conditions, and the live familiar condition appears to be the most favorable.
- These differences were not explained by memory or repetition.
- Clinical Application: Incorporate a live, familiar person into technological therapy.
- Note: The live condition may be even more important than familiarity, so avenues could be explored for volunteers to work with people with aphasia on technological therapy.

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