Feb 22nd, 5:00 PM - 6:00 PM

The Impact of Salient Naming Targets During Aphasia Therapy

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The Impact of Salient Naming Targets During Aphasia Therapy

Kathy Molesh, Catherine Off, Jenna Griffin and Craig McFarland, University of Montana

Background & Significance

Aphasia Defined

- Aphasia currently affects 2-4 million Americans (Damasio-Markie, 2018)
- Aphasia is an acquired communication disorder caused by damage to the language areas of the brain
- All modalities of communication including reading and writing may be affected
- Word retrieval difficulty is the most ubiquitous characteristic of aphasia (Blumstein, 2005)
- 30% of stroke survivors develop aphasia but infections, traumatic brain injuries, tumors, and neurologic disease can all cause aphasia (NIA, 2017)
- Persons with aphasia (PWAs) often experience limited communicative and social participation and reduced psychosocial well-being (Davidson et al., 2008; Glisanella et al. 2011; Cruise et al. 2005; Hilti et al. 2003; Hilti & Byng, 2009; Hilti et al., 2012; Ross & Wertz, 2003)
- The World Health Organization (WHO-ICF,2001) assesses the personal impact of aphasia on an individual’s ability to participate and engage in activities across multiple environments

Aphasia Treatment

- Translational research between speech-language pathologists and neuroscientists has led to therapies that incorporate principles of neuroplasticity (Raymer et al., 2008)
- Neuroplasticity principles of constraint, intensity, and repetition have been used to treat aphasia induced word retrieval but they do not address the personal factors of the WHO-ICF model (Pulsuemuller et al., 2001; Menon, 2007; Masek et al., 2017)

Salience as a Principle of Neuroplasticity

- The neuroplasticity principle of salience has received less attention from researchers than other principles such as dose and intensity (Pulsuemuller et al., 2001; Menon, 2007; Masek et al., 2017)
- Neuroscientists have identified a salience network (Menon,2015; 2017) in the brain that identifies biologically and cognitively relevant events that shape behavior (Reissner et al., 2017).
- Language therapies that incorporate salience rely on personally important and motivating stimuli
- Preliminary studies that incorporate salience during picture word matching and script-training therapies are promising (McKiley et al., 2015; Cherny et al., 2015)

Research Question

Does using salient naming targets increase naming accuracy during confrontational picture naming tasks for stroke survivors with chronic aphasia?

Method

Research Design

- Single subject A-B-A research design was implemented to assess the role of salience during naming acquisition

Participants

- 2 stroke survivors with chronic aphasia enrolled in 2018 Big Sky Intensive Comprehensive Aphasia Program (ICAP)
- Impairment based measures-Western Aphasia Battery-R, Boston Naming Test, Assessment of Living with Aphasia

Table 3

<table>
<thead>
<tr>
<th>Participant Characteristics</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>64 years</td>
<td>65 years</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>MPO</td>
<td>48 months</td>
<td>31 months</td>
</tr>
<tr>
<td>CVA – location/type</td>
<td>LMCA/ischemic</td>
<td>LCA/ ischemic</td>
</tr>
<tr>
<td>Education level</td>
<td>Master’s</td>
<td>Master’s</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>Single</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td>Caucasian</td>
<td>Caucasian</td>
</tr>
</tbody>
</table>

Note. MPO = months post-onset of stroke, LMCA= left middle cerebral artery, LCA= left carotid artery

Table 4

Pretreatment Assessment Scores

<table>
<thead>
<tr>
<th>Assessment</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAB-R Aphasia quotient</td>
<td>70.1/100</td>
<td>89.4/100</td>
</tr>
<tr>
<td>WAB-R Spontaneous speech</td>
<td>13/20</td>
<td>18/20</td>
</tr>
<tr>
<td>WAB-R Auditory verbal</td>
<td>9.1/10</td>
<td>9.2/10</td>
</tr>
<tr>
<td>Comprehension</td>
<td>6.2/10</td>
<td>9.4/10</td>
</tr>
<tr>
<td>WAB-R Repetition</td>
<td>6.8/10</td>
<td>8.1/10</td>
</tr>
<tr>
<td>BNT-2 (standard form)</td>
<td>40/60</td>
<td>35/60</td>
</tr>
<tr>
<td>ALA</td>
<td>3.5/4</td>
<td>3.11/4</td>
</tr>
</tbody>
</table>

Note. WAB-R= Western Aphasia Battery Revised, BNT-2= Boston Naming Test-2, ALA= Assessment of Living with Aphasia

Picture Naming Stimuli

- Participants chose 25 salient words from a list from 100 word list (Palmer, et. al., 2017) and 5 personally salient words.
- Control stimuli were selected to match salient targets’ syllable length and frequency.
- Photographic pictures were created for all salient and control stimuli

Probe Sessions

- Three baseline naming probes given to assess pre-treatment naming
- Three naming probes given during treatment
- Treatment consisted of twelve, 45 minute evidence- based naming therapies provided by supervised graduate clinicians.
- Three post therapy naming probes
- All probes and interventions given over 5 weeks of the ICAP
- All control and salient stimuli were presented each session.
- All probes were randomized
- Naming results were recorded and scored for accuracy and errors were analyzed

Data Analysis

- Descriptive statistics and effect sizes calculated for treatment effects using the control vs salient stimuli
- Probe results presented in graphs to visualize changes in naming accuracy

Results

RQ1: Does the incorporation of salient targets increase naming accuracy during confrontational naming tasks?

Discussion and Limitations

- This phase I-2 study has demonstrated that incorporation of salient targets increases naming accuracy.
- Salient targets provide personally relevant, motivating therapy
- Results are applicable across multiple environments.
- Example: “coffee” salient in terms of ordering a cup of coffee during a individual’s morning coffee group.
- Limitations: selection of salient targets since both participants could name several targets prior to treatment. Choose targets participants are unable to produce prior to initiation of study.
- Multiple Participant study for further analysis of saliency used in aphasia therapy