Semantic and phonological knowledge in early and late learners of American Sign Language (ASL)
Sarah Fish, Rama Novogrodsky, & Robert Hoffmeister
The Center for the Study of Communication and the Deaf, Boston University

Background:
- Most children with access to language develop vocabulary that includes synonyms (Doherty & Perner, 1998; Stahl, 1999).
- Hearing children under the age of four typically failed a synonym task, while children four years of age and older usually passed it (Doherty & Perner, 1998).
- At present, only one study has tested synonym knowledge in sign language (Borman, Stoefen-Fisher, Taylor, Draper, Niederklein, 1988).
- As one becomes more proficient in ASL, one produces fewer phonological errors and more semantic errors. (Mayberry & Fischer, 1989)
- This type of contrast can provide clues regarding which stage of lexical-semantic processing has been disrupted in atypical language acquisition (Breese & Hillis, 2004).
- For this study, we predicted that:
  - older children will perform more accurately on the task than younger children,
  - Deaf children of Deaf parents (DCDP) will outperform Deaf children of hearing parents (DCHP), and
  - younger children will tend to select phonological foils, whereas older children will tend to select semantic foils.

Method:
Participants all completed a synonyms task that is a 15-item video-based receptive multiple-choice subtest of the ASL Assessment Instrument (Hoffmeister, Bahan, Greenwald, & Cole, 1989). A subset of 6 questions were analyzed, those that adhered to the following structure: a prompt followed by (in random order) the target, a semantic foil, a phonological foil to the prompt, and an unrelated foil.

Results: The performance of both groups showed developmental improvement, with older DCDP performing significantly better than younger DCDP. Additionally, older DCDP performed significantly better than older DCHP.

Discussion:
- While DCDP establish the vocabulary and linguistic skills required to correctly identify the synonyms in the tested sub-set by 13;0-14;0, DCHP in both age groups struggle with this task. Results suggest that DCHP rely on phonological surface structure even at 13;0-14;0.
- In our sample, DCDP are able to complete this synonyms task at better than chance levels. Crucially, it should be noted that DCDP were not included in the Borman, et al. (1988) study.
- DCDP behave similarly to typically developing hearing children by relying more on semantic knowledge as they increase in age.
- These results have implications for ASL language assessment and teaching for both DCDP and DCHP, suggesting that particular attention be paid to the strategies Deaf children use for language learning.

Participants

<table>
<thead>
<tr>
<th>Participants</th>
<th>DCDP (native)</th>
<th>DCHP (non-native)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>27</td>
<td>62</td>
<td>89</td>
</tr>
<tr>
<td>(6-7 y.o.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older</td>
<td>22</td>
<td>68</td>
<td>90</td>
</tr>
<tr>
<td>(13-14 y.o.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>130</td>
<td>179</td>
</tr>
</tbody>
</table>

Partial funding for this research is provided by USDEd grant R324A100176 to the Trustees of Boston University. However, this research does not necessarily represent the policy of the USDEd, and you should not assume endorsement by the Federal Government.

We would like to thank the students, teachers, and staff at the data collection schools, for without their support and participation, this research would not be possible.

An error analysis of DCDP responses shows that the younger group chose phonological foils over semantic, but this pattern was reversed for the older group (Figure 2a). In contrast, both DCHP groups chose phonological foils more often than semantic foils (Figure 2b).