Improving subordinate word meaning processing through natural sentence reading

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Introduction
1. There are ambiguous (fan) and unambiguous words (cactus).
2. For ambiguous words, people access all meanings but use context to select the correct meaning (1,3).
3. Lexical-semantic representations are flexible: exposure to subordinate meanings can bias a listener/reader to that meaning in future (2).

What is the purpose of our study?
To discover whether processing of subordinate meanings can be improved by exposure to BOTH the dominant and subordinate meanings.

Why is this important?
Such exposure is more like real word language experience.

Methods
1. 60 adults - Native English speakers - Recruited online through Prolific.
2. 3x2 design: 3 types of word meanings (Dominant, Subordinate & Unambiguous); 2 training conditions (Trained & Untrained).
3. People read two sentences for 14 ambiguous words - one described the subordinate and one the dominant meaning. Also read two sentences for 14 unambiguous words.
4. Then tested on all trained items and 14 ambiguous and 14 unambiguous untrained items.

Tasks used in this experiment

<table>
<thead>
<tr>
<th>First sentence</th>
<th>Check sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>An explanation of the error codes can be found in appendix G or by pressing the HELP key.</td>
<td></td>
</tr>
<tr>
<td>To continue press the space bar</td>
<td>c = False m = True</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target or Filler word</th>
<th>Probe word</th>
</tr>
</thead>
<tbody>
<tr>
<td>appendix</td>
<td>SPLEEN</td>
</tr>
<tr>
<td>c = unrelated m = related</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Training Task (Sentence Comprehension Task)
Figure 2. Test Task (Semantic Relatedness Task)

Results
Semantic Relatedness Task

Graph 1. Proportion Errors
Graph 2. Reaction Times (ms)

Linear Mixed Effects Models
Errors
Max. Model vs Predictor Variables:
1. No significant effect of training.
2. Significant effect of type of probe word (β = -1.362, χ² = 104.67, df = 1, p < 0.001).
3. Significant interaction (β = 0.64, χ² = 5.522, df = 1, p = 0.019).

Response Times
Max. Model vs Predictor Variables:
1. No significant effect of training.
2. Significant effect of type of probe word (β = -0.047, χ² = 46.191, df = 1, p < 0.001).
3. No significant interaction.

Conclusions
1. Training the dominant & subordinate meanings decrease errors and response times for subordinate meanings. But, this decrease in non-significant for RTs.
2. To increase the training effect on subordinate meanings:
   3. Improve power, by increasing the number of participants and subordinate meanings evaluated.
   4. Increase accuracy at test, by changing some probes

References