Native and non-native sentence comprehension in the presence of a competing talker

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Native and non-native sentence comprehension in the presence of a competing talker

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Introduction

1) In everyday environments, we often have to attend to one person (target speech) while ignoring another (competing speech). Competing speech can mask the target through energetic masking (EM), acoustic degradation at the periphery, and informational interference (higher-order, cognitive aspects of masking).

2) Many studies have investigated the effect of masking on sound and word identification. Fewer have investigated its effect on sentence comprehension.

3) This study aims to test whether informational interference is especially detrimental (relative to energetic masking) to sentence comprehension, particularly to sentences requiring a greater amount of processing resources, such as syntactically complex sentences, as in the examples below.

4) Is a competing talker more detrimental to sentence comprehension for L2 listeners?

Research questions

1) Is a competing talker (relative to energetic masking) to sentence comprehension, particularly to sentences identification. Fewer have investigated its effect on sentence comprehension.

2) Does the syntactic complexity effect (Obj Rel vs Subj Rel) generalise across types of masks and language background?

3) Is a competing talker more detrimental to comprehension of more complex target sentences (Obj Rel)?

4) Is a competing talker more detrimental to sentence comprehension for L2 listeners?

Method

Participants

1) L1 normal hearing British students, N = 36
2) L2 normal hearing Danish students, N = 19

Materials

1) Increasing syntactic complexity of target sentence
2) SNR = 5dB
3) Simple sentence (SS)
4) Subject Relative (SR)
5) Object Relative (OR)
6) No mask
7) Reversed competing talker (RC)
8) Speech-modulated noise (SMN)
9) Competing talker (CT)

Task: Speeded picture selection

Results

Button press accuracy

<table>
<thead>
<tr>
<th></th>
<th>Native</th>
<th>Non-native</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>95%</td>
<td>93%</td>
</tr>
<tr>
<td>Subj Rel</td>
<td>96%</td>
<td>94%</td>
</tr>
<tr>
<td>Obj Rel</td>
<td>94%</td>
<td>92%</td>
</tr>
</tbody>
</table>

Results

Button press reaction times

<table>
<thead>
<tr>
<th></th>
<th>Native</th>
<th>Non-native</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>850ms</td>
<td>900ms</td>
</tr>
<tr>
<td>Subj Rel</td>
<td>900ms</td>
<td>950ms</td>
</tr>
<tr>
<td>Obj Rel</td>
<td>950ms</td>
<td>1000ms</td>
</tr>
</tbody>
</table>

Eye-tracking (non-native only)

<table>
<thead>
<tr>
<th></th>
<th>Simple</th>
<th>Subject Relative</th>
<th>Object Relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
<td>60%</td>
<td>65%</td>
<td>60%</td>
</tr>
<tr>
<td>SR</td>
<td>65%</td>
<td>70%</td>
<td>65%</td>
</tr>
<tr>
<td>OR</td>
<td>70%</td>
<td>75%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Conclusions

1) A competing talker is not always more detrimental than energetic masking alone. In this task, listeners’ processing was equally unperturbed across masks.

2) The effect of syntactic complexity (Obj Rel vs Subj Rel) was replicated in all masked and unmasked conditions, both in native and non-native listeners.

3) Even when confronted with more complex syntax, native and non-native listeners’ sentence processing was singularly robust to masking.

4) Non-native listeners’ ability to overcome energetic masking and informational interference is just as robust as native listeners’, even though non-native listeners’ reaction times were slower across all conditions.

References


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