time, several words compatible with the currently available phonemic information are activated, while overlapping candidates that share one or several phonemes inhibit one another. This double process of multiple activation and competition between overlapping word candidates ensures that each phoneme is ultimately assigned to one and only one word. This process has been modelled and shown to allow for efficient word segmentation...
when followed by a phonological phrase boundary (in 'bal][con'-sentences) than when they were the first syllable of a bisyllabic word (lines 2 and 3 of table 1). Similarly, /6/ and /LE/ were longer when followed by a phonological phrase boundary (in 'balcon'-sentences) than when they belonged to the first syllable of a multisyllabic verb.
Another experimenter in the control room observed the infant on a video monitor and judged whether the infant looked into the camera. Throughout all sessions, parent and assistant listened to acoustic masking over noise-attenuation headphones. At any time, the experimenter could also ask the assistant to change her behaviour, via a microphone connected to the assistant’s headphones. The experimenter initiated trials when infants’ attention was focused at midline by pressing the left mouse button. When the infant turned its head towards the loudspeakers, the experimenter pressed the right mouse button to signal a head-turn. The computer delivered reinforcement only if it was an appropriate head turn (i.e. to a target word).

The training session comprised the shaping and the criterion phases. During this session, infants heard a background word which was played continuously, presented at a comfortable listening level (68 dB SPL-b) with 1000 ms inter-stimulus interval. When a stimulus was delivered, the background word was replaced by three repetitions of the target word, allowing for a response window of 4 seconds. Infants in the bisyllabic group heard the words ‘balcon’ (balcony) and ‘vipère’ (viper) and infants in the monosyllabic group heard the words ‘bal’ (ball) and ‘vie’ (life). For each infant, one of the words served as target and the other one as background (half the infants in the bisyllabic group heard ‘balcon’ as target and the other half heard ‘vipère’ as target; similarly, half the infants in the monosyllabic group heard ‘bal’ as target and the other half heard ‘vie’ as target). Only head-turns occurring while the target word was being played were reinforced, in order to teach infants to turn their head toward the beginning of a sentence.

Table 2: Pitch and energy of the vowels constituting the critical sequences (‘balcon’ and ‘vipère’, V1 and V2 respectively), as well as one vowel before the critical sequence to compute pitch movements before phonological phrases (visible on the ellipses drawn on Fig. 1).

<table>
<thead>
<tr>
<th></th>
<th>PP boundary</th>
<th>No boundary</th>
<th>Difference</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pitch (Hz)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean (SE)</td>
<td>Mean (SE)</td>
<td>Mean</td>
<td>t(23)</td>
</tr>
<tr>
<td>V0</td>
<td>272 (8.4)</td>
<td>307 (11.2)</td>
<td>-35</td>
<td>2.9</td>
</tr>
<tr>
<td>V1 (a / i)</td>
<td>349 (8.3)</td>
<td>273 (8.7)</td>
<td>76</td>
<td>6.9</td>
</tr>
<tr>
<td>V2 (b / e)</td>
<td>357 (9.1)</td>
<td>392 (5.4)</td>
<td>-35</td>
<td>3.5</td>
</tr>
<tr>
<td>V1-V0</td>
<td>77 (10.0)</td>
<td>-34 (16.5)</td>
<td>111</td>
<td>6.2</td>
</tr>
<tr>
<td>V2-V1</td>
<td>8 (12.3)</td>
<td>119 (10.7)</td>
<td>-111</td>
<td>7.2</td>
</tr>
<tr>
<td>Energy (rms)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1 (a / i)</td>
<td>0.155 (0.01)</td>
<td>0.154 (0.01)</td>
<td>0.001</td>
<td>&lt;1</td>
</tr>
<tr>
<td>V2 (b / e)</td>
<td>0.148 (0.01)</td>
<td>0.104 (0.01)</td>
<td>0.044</td>
<td>4.5</td>
</tr>
</tbody>
</table>
stream into syllable-sized units. At 12 months of age, they extracted the final syllables of the target syllable words rather than segmenting the target words as coherent units. The word segmentation would thus be represented as [word].
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References


