Mapping French Verbal Inflection from Event-Related Potentials: The Time-Course Processing

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Introduction

Word recognition and production is mediated by morphological processing. Verbs are decomposed in stem and inflectional suffixes for lexical access and morphosyntactic feature activation (Toda & Marantz, 1994). However, it is not clear if complex words are early or late decomposed and which units are represented in the mental lexicon.

Method

Investigate the morphological decomposition and the inflectional suffix time-course processing in present and past tenses, and in singular and plural agreements, based on RT, accuracy, and ERP.

Participants: 16 (8 males), mean age 23.44, right-hand, French as L1, BAC+1.
Procedure: visual lexical decision task on French inflected verbs.
Stimuli: 20 verbs per condition, 160 experimental stimuli.
Variables: DV; RT, DV; ACC, DV; ERPs; IV; tense, IV; agreement.
EEG: 64 channels actiCAP; BrainSystems; mastoid REF; ≤5K; SH: 1KHz.

<table>
<thead>
<tr>
<th>Agreement/Tense</th>
<th>Present</th>
<th>Past (Imp.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2sg: Tu ‘You’</td>
<td>parle-s</td>
<td>parle-ai-s</td>
</tr>
<tr>
<td>3sg: Il ‘He’</td>
<td>parle-ai</td>
<td>parle-ai-t</td>
</tr>
<tr>
<td>1pl: Nous ‘We’</td>
<td>parle-ons</td>
<td>parle-i-ons</td>
</tr>
<tr>
<td>2pl: Vous ‘You’</td>
<td>parle-ez</td>
<td>parle-i-ez</td>
</tr>
</tbody>
</table>

Behavioral Results

• Tense: Significant difference only in singular forms; Agreement: Significant difference only in present forms.
• Longer RTs in past tense than present tense; Longer RTs in singular agreement than plural agreement (Estivalet; Marantz, submitted).
• ACC results support and confirm the RT results.

Discussion

All French verbs might be decomposed in stem and inflectional suffixes for lexical access (Estivalet; Marantz, 2015). Our results confirmed N400 differences between present and past tenses, but no ERP differences between singular and plural agreements. P600 might reflect later form reanalysis.

Answers
• Lexical knowledge is represented in the mental lexicon as atomic morpheme-based hierarchical structures.
• Complex words are early pre-lexically decomposed for lexical access and word recognition.
• There are differences in tense, but not in agreement processing.
• Tense is early processed (N400) and agreement later verified (P600).

Overall, our results suggest a full-decomposition model (Lavric, Ethkepp, & Rastle, 2012) where complex words are early decomposed in stem and inflectional suffixes, then the morphosyntactic features are activated, and later the word is recombined and verified (Halle & Marantz, 1994).

References