Stridency and Differential Substitution in Two Dialects of French

Karen Jesney
Department of Linguistics, University of Calgary
kjjesney@ucalgary.ca

Outline:

1. Definition of the problem
3. Featural specification and interdental substitution in European French
4. Featural specification and interdental substitution in Quebec French
5. Assibilation in the English interlanguage of native speakers of Quebec French
6. Summary

1. Definition of the Problem

Differential substitution:

• Systematic replacement of ‘new’ sounds in the L2 by segments that are part of the L1 inventory.

The English interdental fricatives, as in (1), are particularly uncommon sounds cross-linguistically (i.e., marked) and thus are ‘new’ sounds for many learners of English as a second language.

(1) thing [θɪŋ] that [θæt] three [θriː] these [θiːz]

A fairly substantial range of segments have been reported as the preferred substitutes for target /θ-ð/, the most common being /s-z/ and /t-d/.

Normally all native speakers of a given L1 select the same replacement segment, suggesting that the segment chosen is a function of some aspect of the L1.

Not only first language can be important, however. Indeed, substitutions selected by native speakers of French for the English interdentals seem to be largely dependant upon the specific dialect of French spoken as the L1 (Hancin-Bhatt 1994):

• L1 Standard European French: θ → s; ð → z
• L1 Standard Quebec French: θ → t; ð → d


Lombardi (2003) proposes an account of the differential substitution of the English interdentals based in Optimality Theory

• Draws on the structure and function of constraints affecting Manner features ([stop], [continuant], [strident])

(2) Prediction of Lombardi (2003: 237)

if the L1 has . . . no phonological alternations involving stops, affricates and fricatives . . . speakers of such a language should substitute stops for English [θ]"

I argue that Lombardi is correct in identifying features such as [continuant] and [strident] as key in determining patterns of differential substitution, but that the prediction in (2) is overly general

• Specifically, the patterns of interdental substitution in EF and QF provide a counterexample to the pattern suggested in (2).

3. Featural Specification and Interdental Substitution in European French

European French has a phonemic inventory that contrasts stops, fricatives, liquids and nasals.

(3) EF consonantal inventory (Walker 2001: 119)

labial coronal velar uvular

stops p b t d k g
fricatives f v s z ɾ ʒ
nasals m n ɲ ñ
liquids l r

No phonemic contrasts crucially rely on the feature [±strident]

• EF does not contrast [+strident] and [-strident] fricatives at a single place of articulation (e.g., /s/ vs. /θ/)
Stridency and Differential Substitution in Two Dialects of French

Karen Jesney

- EF has no [+strident] stops (affricates) that contrast with plain stops at a single place of articulation (e.g., /t/ vs. /tʃ/)
- All phonemic contrasts within the obstruent system can be expressed in terms of continuancy contrasts.

Furthermore, EF has no phonological process such as asssibilisation or palatalisation that draws on stridency.

Indeed, it would seem that [+strident] is completely phonologically inactive in the dialect, yielding the (simplified) segmental representations below.

(4) Continuancy based contrasts in L1 European French

\[
\begin{array}{c|c|c}
/s/ & /t/ \\
\hline
\text{Place} & \text{Place} \\
\text{Coronal} & \text{Coronal} \\
\end{array}
\]

\[
\begin{array}{c|c|c}
\text{[+cont]} & \text{[-cont]} \\
\text{[+cont]} & \text{[-cont]} \\
\end{array}
\]

Assuming that speakers initially encode the L2 phonetic signal using features active in their L1 (cf. Brown 1997, 2000), incoming English interdental fricatives will be mapped, on the basis of active feature similarity, to /s/.

(5) Mapping of \(\theta\) to /s/ in L1 European French

\[
\begin{array}{c|c|c}
/\theta/ & /s/ \\
\hline
\text{Place} & \text{Place} \\
\text{Coronal} & \text{Coronal} \\
\end{array}
\]

Because stridency is not active in the dialect, no phonemic distinctions can be initially made on its basis and /\(\theta\)/ is ‘mismapped’ to /s/.

4. Featural specification and Interdental Substitution in Quebec French

Like European French, Quebec French has a phonemic inventory that contrasts stops, fricatives, liquids and nasals.

(6) QF consonantal inventory (Walker 1984: 90)

- labial
- coronal
- velar
- uvular

\[
\begin{array}{c|c|c|c|c|c|c|c}
\text{stops} & \text{labial} & \text{coronal} & \text{velar} & \text{uvular} \\
\hline
\text{p} & \text{b} & \text{t} & \text{d} & \text{k} & \text{g} \\
\text{fricatives} & \text{f} & \text{v} & \text{s} & \text{z} & \text{ʃ} & \text{ʒ} \\
\text{nasals} & \text{m} & \text{n} & \text{j} & \text{ŋ} & \text{ŋ} & \text{n} \\
\text{liquids} & \text{l} & \text{ɾ} & \text{n̥} & \text{ŋ̥} & \text{ń} & \text{ɲ} \\
\end{array}
\]

No phonemic contrasts crucially rely on the feature \([±\text{strident}]\)

- QF does not contrast [+strident] and [-strident] fricatives at a single place of articulation (e.g., /s/ vs. /ʃ/)
- QF has no [+strident] stops (affricates) that contrast with plain stops at a single place of articulation (e.g., /t/ vs. /tʃ/)

If one only considers phonemically-contrastive features, then, one would expect QF learners of English to behave in the same manner as EF learners, substituting /s-z/ for /θ-ð/.

Unlike European French, however, Quebec French does have a phonological process that draws on the \([±\text{strident}]\) distinction, namely, asssibilisation.

- In QF, coronal stops (/t/ and /d/) are realized as [+strident] (/tʃ/ and /dʒ/) when followed by a high front vowel or glide (/i, i, y, y, j, ʃ/).

(7) Assibilation in Quebec French

\[
\begin{array}{c|c|c}
\text{t} & \rightarrow & \text{tʃ} \\
\text{d} & \rightarrow & \text{dʒ} \\
\end{array}
\]

\[
\begin{array}{c|c|c|c}
\text{type} & \text{[tʃip]} & \text{dire} & \text{[dʒiːʃ]} \\
\text{turc} & \text{[tʃyʁk]} & \text{dure} & \text{[dʒyʁk]} \\
\text{tuile} & \text{[tʃil]} & \text{diable} & \text{[dʒil]} (\text{Papen 1998: 165}) \\
\end{array}
\]

Following Clements (2001), then, stridency must be an active feature in this dialect. The (simplified) segmental representations for /t/, /d/ and /tʃ/ are thus those given in (8).

(8) Continuancy & Stridency based contrasts in L1 Quebec French

\[
\begin{array}{c|c|c|c}
/t/ & /tʃ/ & /s/ \\
\hline
\text{Place} & \text{Place} & \text{Place} \\
\text{Coronal} & \text{Coronal} & \text{Coronal} \\
\text{[+strident]} & \text{[+strident]} & \text{[+strident]} \\
\end{array}
\]
Assuming, following Brown (1997, 2000), that features utilized in the L1 are correctly perceived by the L2 learner, a mismatch between the input and its possible mappings results.

(9) Mapping of θ to ? in L1 Quebec French

\[
\begin{array}{c}
/\theta/ \\
\quad \Rightarrow \\
\text{Place} \\
\quad \downarrow \\
\text{Coronal} \\
\quad \downarrow \\
[-\text{strident}] \\
\end{array}
\]

Unlike for native speakers of EF, no direct mapping of the perceived features of /θ/ is available to native speakers of Quebec French.

Both the L1 representation of /t/ and the L1 representation of /s/ differ from target /θ/ by one feature.

• /t/ differs from target /θ/ in continuancy
• /s/ differs from target /θ/ in stridency

Until native speakers of QF are able to construct the novel segmental representation for /θ/, a substitute must be used to encode words employing this segment.

/t/ is the preferred substitute in this instance based on two factors: general markedness and secondary cues.

• Stops are less marked than fricatives
  • some languages lack fricatives, but no language lacks stops
  • stops normally emerge before fricatives in child language
• In QF /t/ is normally produced at the dental place of articulation (like /θ/); /s/, for its part, is normally produced at the alveolar place of articulation.
• the secondary minor place cue (i.e., dental vs. alveolar) shared by /t/ and /θ/ but not /s/reinforces the bias toward /t/ as a substitute for /θ/ (cf. Teasdale 1997)

For native speakers of QF, then, target /θ/ is mismapped to /t/ in the early stages of acquisition.

5. Assibilation in the English Interlanguage of Native Speakers of Quebec French

I have claimed here that there is an actual phonological mismapping that occurs at the early stages of L2 acquisition. This is not an uncontroversial claim:

• Under normal assumptions of learning in Optimality Theory, it is argued that inputs are (potentially) fully specified.
• In the L2 acquisition literature in OT, this is normally taken to mean that second language learners are able to perceive and correctly encode all of the L2 features and featural combinations – INCLUDING THOSE NOT USED IN THE L1.
• In other words, it should not be necessary for there to be a mismapping – if both [-strident] and [+continuant] are perceived, a target-appropriate representation, as in (10), should be stored.

(10) Target-appropriate representation

\[
\begin{array}{c}
/\theta/ \\
\quad \Rightarrow \\
\text{Place} \\
\quad \downarrow \\
\text{Coronal} \\
\quad \downarrow \\
[-\text{strident}] \\
\end{array}
\]

Question:

• Are target /θ/ segments stored target-appropriately as in (10), or are they mismapped to an existing L1 representation as suggested in sections 3 and 4?

Possibility number 1: If it is the case that target /θ/ segments are stored target-appropriately as in (10), and the mechanism causing assibilation in the L1 is transferred to the interlanguage (cf. Schwartz & Sprouse 1996), it is predicted that:

• Target /t/ segments should be subject to assibilation
• Target /θ/ segments should not be subject to assibilation; rather they should be realized as [s] (or possibly [t]) before high front vowels and glides
Possibility number 2: If it is the case that target /θ/ segments are mismapped and are instead stored as /t/, and the mechanism causing assimilation in the L1 is transferred to the interlanguage, it is predicted that:

- Target /t/ segments should be subject to assimilation
- Target /θ/ segments (which are misencoded as /t/ segments) should also be subject to assimilation

In the pilot study, it was found that speakers (inconsistently) assimilated both target /t/ and target /θ/ segments before high front vowels and glides.

(11) Assibilation of target /t/ in the interlanguage of L1 QF speakers

<table>
<thead>
<tr>
<th>word</th>
<th>phonetic form</th>
</tr>
</thead>
<tbody>
<tr>
<td>tip</td>
<td>[tʰp]</td>
</tr>
<tr>
<td>tear up</td>
<td>[tʰjap]</td>
</tr>
<tr>
<td>team</td>
<td>[tʰim]</td>
</tr>
<tr>
<td>ticket</td>
<td>[tʰiket]</td>
</tr>
</tbody>
</table>

(12) Assibilation of target /θ/ in the interlanguage of L1 QF speakers

<table>
<thead>
<tr>
<th>word</th>
<th>phonetic form</th>
</tr>
</thead>
<tbody>
<tr>
<td>theme</td>
<td>[tʰim]</td>
</tr>
<tr>
<td>healthy</td>
<td>[helθi]</td>
</tr>
<tr>
<td>theory</td>
<td>[tʰioθi]</td>
</tr>
<tr>
<td>theatre</td>
<td>[tʰiedə]</td>
</tr>
</tbody>
</table>

This supports possibility number 2, suggesting that there is, indeed, the option of phonological mismapping at least at the early stages of acquisition.

6. Summary

The opposing substitution patterns of native speakers of Standard European French and Standard Quebec French stem from differences in the way in which the two dialects make use of the feature [±strident].

These differences lead to different initial phonological ‘mismappings’ of the English interdentals

- In European French [±strident] is phonologically inactive and does not form part of the L1 segmental representations. Consequently, continuancy is the only relevant feature in determining a mapping for target /θ/ and the fricative /s/ is selected.

- In Quebec French both [±strident] and [±continuant] are phonologically active and form part of the L1 segmental representations. Given that, factually, /s/ and /t/ are equally good substitutes for /θ/, the less marked /t/ is selected.

In early stages of acquisition, these mismappings serve as input into the phonological constraint system.

Target-like second language proficiency can be reached once:

- Novel segmental representations are constructed
- These novel representations are appropriately diffused throughout the lexicon
- Unnecessary L1 phonological processes (e.g., assimilation) are suppressed.

7. References


Special thanks to John Archibald and Darin Howe for their helpful feedback on the various manifestations of this work, to Sylvie Roy for her assistance in recruiting subjects for the pilot study, and, of course, to the participants themselves. All errors and oversights are my responsibility alone.