Early templates in the acquisition of French phonology

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Main Topics

• Developmental patterns in the acquisition of French phonology in a templatic model

• How the phonological system arises through templates and is constrained simultaneously by
  - typology (segmental and suprasegmental specificities of French)
  - markedness
  - individual preferences (continuity with babbling)

• Longitudinal comparison between children acquiring the same language: observation of the structures, the dynamic and the limits of the individual variation

Outline

1- Some aspects of French

2- Our hypotheses on French templates

3- French data in the ESRC project

4- Results: Segmental tendencies

5- Results: Rhythmic and syllabic tendencies

6- Conclusion
Some aspects of French

Accent in French

• French is NOT a lexical-stress language

• French has an accent at the end of a group / an utterance and a counter-accent at the beginning  
  (Fonagy, Rialland, Vaissière, Di Cristo)

The accent falls on the last full syllable of a group  
(syntactic, semantic or breath group)

  Marie aime son cheval (Mary loves her horse)  
  Marie aime son cheval noir  (Mary loves her black horse)  
  Marie aime son cheval noir et blanc  (Mary loves her black and white horse)
French: a syllabic language
French is not an iambic mirror image of English

- Open syllabification even through the words
  ex: enchaînement
  *petite orange*: [pə/ti/ʃ] + [o/ʁɑ̃ʒ] will be syllabified [pə/ti/to/ʁɑ̃ʒ]

- Syllabic isochrony
- No vowel reduction

Fillers and proto-determiners

- The first unit produced by French children is typically a noun but not an isolated noun. It includes one syllable or at least one nucleus before the noun (Bassano et al, 2008; Vénéziano et al., 2011)

- 3 stages
  - pre-fillers stage (no fillers)
  - underspecified fillers
  - morphologically specified units

- Main structures: (V) CV or (V)CVCV
• Templates are simultaneously constrained by:
  - individual preferences
  - typological specificities: for French rhythm and open syllabification
  - universal constraints: the specific patterns observed in children’s data reflect markedness avoidance principle
Templates in French

• Typological patterns will be expressed in
  - open syllabification
  - no vowel reduction
  - early systematic prenominal fillers

• Observe how typological regularities and markedness constraints are expressed in the specific developmental patterns for each child

French data in the ESRC Project
ESRC Project: PARIS 8 - YORK

- « Psychological significance of production templates in phonological and lexical advance: A cross-linguistic study »

- Head: M. Vihman - T. Keren-Portnoy (York)

- Partners’ teams
  - Newcastle (G. Khattab – J. Al Tamimi)
  - Paris (S. Wauquier - N. Yamaguchi)

- Duration: 3 years

Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Birth Date</th>
<th>Recordings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adeline</td>
<td>F</td>
<td>09/05/2008</td>
<td>13</td>
</tr>
<tr>
<td>Bastien</td>
<td>M</td>
<td>17/05/2008</td>
<td>14</td>
</tr>
<tr>
<td>Beryl</td>
<td>F</td>
<td>24/05/2008</td>
<td>12</td>
</tr>
<tr>
<td>Julien</td>
<td>M</td>
<td>30/06/2008</td>
<td>12</td>
</tr>
<tr>
<td>Marie</td>
<td>F</td>
<td>16/04/2008</td>
<td>13</td>
</tr>
<tr>
<td>Romuald</td>
<td>M</td>
<td>16/03/2008</td>
<td>8</td>
</tr>
<tr>
<td>Vincent</td>
<td>M</td>
<td>14/07/2008</td>
<td>12</td>
</tr>
</tbody>
</table>

- 3 girls et 4 boys
- Mean age at the beginning of the recording: 1;07
Method

- Each recording 30 min, each month, one year
- Familiar surrounding: home
- Playing with one of the parents (no elicitation)

- Camera semi-pro Sony (2 separated audio channel)
- 2 microphones Sennheiser EW 122 p G3: 1 for the parent, 1 for the child
- Vest made for the children

Tools

- PHON software: transcription and phonological analyses

- Inventaire français du développement communicatif
  (F-CDI, Kern & Gayraud, 2007, 2010)
• Idiosyncratic templates expressing individual preferences:

  - on consonants:
  Bastien : Template Labiale-V-Coronale-V (1;10,02)

<table>
<thead>
<tr>
<th>Selected words</th>
<th>Adapted words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin [pata]</td>
<td>Lapin (rabbit) [pata]</td>
</tr>
<tr>
<td>Malade (sick)  [mana]</td>
<td>Marie [manc]</td>
</tr>
<tr>
<td>Ballon (balloon) [balu]</td>
<td></td>
</tr>
</tbody>
</table>
• Idiosyncratic templates expressing individual preferences:

- on consonants:
  Romuald: Consonant Harmony (2;02,11)

<table>
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<th>Adapted words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedans (inside)</td>
<td>[dodo]</td>
</tr>
<tr>
<td>Bébé (baby)</td>
<td>[bcbc]</td>
</tr>
<tr>
<td>Bateau (boat)</td>
<td>[tato]</td>
</tr>
<tr>
<td>Oiseau (bird)</td>
<td>[sa3o]</td>
</tr>
<tr>
<td>Guitare (guitar)</td>
<td>[teta]</td>
</tr>
</tbody>
</table>

• Idiosyncratic templates expressing individual preferences:

- on vowels:
  Beryl (1;06,23): vocalic melody a/o on a aCo template

<table>
<thead>
<tr>
<th>Adult words</th>
<th>Child’s productions</th>
</tr>
</thead>
<tbody>
<tr>
<td>agneau [apo]</td>
<td>lamb [alo]</td>
</tr>
<tr>
<td>bateau (7) [bato]</td>
<td>skip [ato]</td>
</tr>
<tr>
<td>poisson (2) [pwas]</td>
<td>fish [aço]</td>
</tr>
<tr>
<td>éléphant [elefa]</td>
<td>elephant [afo]</td>
</tr>
<tr>
<td>crapaud [kəapo]</td>
<td>toad [ako]</td>
</tr>
</tbody>
</table>
Segmental templates: conclusion

• Segmental material is unmarked
  - Place for consonants: Labial or Coronal
  - Vowels belong to the boundaries of the vocalic triangle: a/o

• Some patterns reduce segmental complexity:
  Consonant Harmony for instance (One consonant specification for the whole word)

Results
Syllabic tendencies
- Simple Structures: 89%
- Complex structures: 11%

Tendencies of the quantitative analysis (6 child. / 5 sess.)

Longitudinal data: open syllables

Sessions
Variability between children

Types of syllables 6 children / 5 sessions

Variability : Bastien / Béryl

Types of syllables longitudinal data Béryl

Types of syllables longitudinal data Bastien

From the beginning and all along the 5 sessions

• Bastien : CV structures

• Béryl : Complex interaction of different open structures
• Interpretation of VCV structures
(3 children for who this structure is very well realized both for adapted and selected words)

• V is mainly a front or central vowel : [a] [ə] [e] [ɛ]

• Interpretation of the vowel in VCV < pluri syllabic words
  ex : [apo] => status of [a] ?
  - internal vowel : CVCV => (C) + VCV
    chapeau => [ʃapo] > [apo]
  - filler : V+ CVCV => V + (CV) CV => V + CV
    un chapeau => [ɛʃapo] > [ɛ + po] > [apo]

BERYL (1;6,23)

<table>
<thead>
<tr>
<th>Main template</th>
<th>Other templates</th>
</tr>
</thead>
<tbody>
<tr>
<td>[oxy] : 2</td>
<td>[ayko] : 1</td>
</tr>
<tr>
<td>[oxy] : 2</td>
<td>[koko] : 1</td>
</tr>
<tr>
<td>[oko] / [tako]</td>
<td>[ahko] : 1</td>
</tr>
</tbody>
</table>

• During the same session : 28 « micro »
• Analysable in V + x where x is quite always CV : [xo, ko]

=> Status of the initial vowel => filler
CV vs CVCV?

- Two kinds of CVCV
  - «true» CVCV with a CVCV target: ballon, chapeau
  - «reduplicated CVCV» with a $C_iV_1C_iV_1$ target: dodo, papa

- Structures $C_iV_1C_iV_1$: highly frequent in French CDS

- In our data: $C_iV_1C_iV_1$ structures are highly frequent, early and accurately produced whereas the «true» CVCV arise later

=>$ early CVCV = mainly « reduplicated CVCV » and not «true CVCV »$

Synthesis

- 1st stable object: CV < final syllable most of the time ([kɔ] « encore»), or initial one ([kɛ] « canard ») or a mix of initial and final syllables ([bu] « bisou »)

- 2nd step: 2 alternatives
  - VCV where V is rather a central or open vowel: [a] [ə] [e] [ɛ]
  - CVCV where CV is reduplicated or at least both C are harmonized

Children can start with both patterns successively (VCV and then CVCV or CVCV and then VCV) or can use both patterns simultaneously.

=>$ Avoidance of consonant clusters$

=>$ Preference for final and internal open structures$
How shall I manage to learn French?

A limited number of learning paths

• Constraints arise and interact systematically

- Typological constraints shared by all the children: no differences on the prosodic shape of the French early template
  - Open structures
  - Early stability of the nuclei
  - Rather built from early CV becoming V+CV or (CV) x 2

- Individual choices: variation is mainly observed in the segmental patterns and segmental templates that do not seem to be typologically constrained (metathesis, consonant harmony, specific melodies)

- But without violation of the markedness: individual segmental patterns are limited by the markedness avoidance principle