Fifteen-month old infants’ sensitivity to vowels’ first and second formant in novel word learning

At 2-4 months:

- F1 & F2 (Lacerda, 1993; 1994)

Vowel height
Vowel backness

Data: Peterson & Barney, 1952

15-months old
Novel words (dit, dɪt, dut)
Switch Task

15-months old
Novel words (dit, dɪt, dut)
Switch Task

Curtin, Fennell & Escudero (2009)

18-months old
Familiar words
Mispronunciation Task

Mani, Coleman & Plunkett (2008)

Switch Task: Werker et al., 1998

MisPr Task: Swingley & Aslin, 2000

Data: Deterding, 1990
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<tr>
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<th>Groups</th>
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<th>Task</th>
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<tr>
<td>Canadian English</td>
<td>RP English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1 ✓</td>
<td>✓ F1</td>
<td>✓ F2</td>
<td>crossed</td>
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Stimuli: dut/d̂t

Learning: dut/d̂t

Groups: dut/d̂t

Predictions: dut/d̂t

Task: dut/d̂t
videos
isolated

Stimuli
Learning
Groups
Predictions
Task

Stimuli
Learning
Groups
Predictions
Task

32 Canadian-English 15-month olds
8 per group

<table>
<thead>
<tr>
<th>taught word</th>
<th>MisPr F1</th>
<th>MisPr F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>dut</td>
<td>dot</td>
<td>dit</td>
</tr>
<tr>
<td>dit</td>
<td>dit</td>
<td>dot</td>
</tr>
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</table>

Excluded: 16 (Fussy & Error)

Stimuli
Learning
Groups
Predictions
Task

Stimuli
Learning
Groups
Predictions
Task

Videos (6 tokens)
Isolated (20 tokens)
Videos (6 tokens)

2 Filler trials
[? ? object]+[filler]

4 CorPr trials
4 MisPr trials
2 Filler trials
<table>
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<th>Video’s (6 tokens)</th>
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<td>Learning</td>
<td>Isolated (20 tokens)</td>
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<td>2 Filler trials</td>
<td></td>
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<tr>
<td>Groups</td>
<td>[named object]+[filler]</td>
</tr>
<tr>
<td>[?? object]+[filler]</td>
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<tr>
<td>Predictions</td>
<td>4 CorPr trials</td>
</tr>
<tr>
<td></td>
<td>4 MisPr trials</td>
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<td>2 Filler trials</td>
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**Learning Groups Predictions**

**Task**

- F1 vs. F2

**Phase*Label**

\[ F(1,25)=7.01, p<0.05 \]

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<th>Learned?</th>
<th>Where is the dVt?</th>
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<td>F1 vs. F2</td>
<td>dVt!</td>
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**Phase*Label**

\[ F(1,25)=7.01, p<0.05 \]
F1 vs. F2

19 Canadian-English 15-month olds

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<th>MP F1</th>
<th>MP F2</th>
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<tr>
<td>dut</td>
<td>7</td>
<td>5</td>
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<tr>
<td>dit</td>
<td>3</td>
<td>4</td>
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10 (before analysis) 13 (not learning)

Excluded: 16 (before analysis) 13 (not learning)

CorPr: Can you find the dut? dut!
MisPr-F1: Can you find the dot? dot!
MisPr-F2: Can you find the dit? dit!

1st CorPr Trial and 1st MisPr Trial

Phase*Pronunciation*MisPr-type
F(1,48)=4.06, p<0.05

F(7)=2.16, p=0.07
F(8)=1.43, p=0.19
Thank you!

All participating parents and children

Stephanie Archer
Natasha Nickel
Melanie Khu
Jennifer Ference

The Speech Development Lab @ UofC

References

F1 and F2 in word recognition

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F1 ✔  ✔ dút  F1 ✔  ✔ F1
F2 ×  × dít  F2 ×  ✔ F2

weighting of F1 & F2 is developmental

References F1 & F2

- F1 and F2 in speech perception
- F1 and F2 in Switch Task
- F1 and F2 in visual choice task

References word learning

- The Switch task:
  The Switch task with different age groups:
  The Switch task with familiar words:
- Visual choice task:
  Mispronunciations in Visual choice task:
  Mispronunciations with one familiar object in Visual choice task: