Acoustic similarities between front rounded and back unrounded vowels as evidenced by French /ø/ and /u/ produced by Japanese-speaking learners

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Research question
How do native speakers of French perceive high back unrounded vowels, produced without grouped F1/F2?

Answer suggested by the present study
As /ø/ or /œ/ (acoustically central vowel).

Hypothesis
Native French listeners perceive back unrounded vowels (Japanese-speaking learners’ less back and rounded French /u/ and synthesized stimuli) as front rounded vowels.

Experiment I
Perception of French /u/ pronounced by Japanese-speaking learners

Stimuli
• French vowels /u/ and /ø/ in isolation.
• Carrier sentence: “Je dis /N/ comme dans …” (e.g. Je dis /l/ comme dans “loap”).
• 5 Japanese-speaking learners (JSL: 3 male and 2 female) studying French in Tokyo.
• 18 tokens x 3 vowels x 4 repetitions.

Experiment II
Perception of synthesized vocoids simulating rounded and unrounded high back vowels

Stimuli
• 9 stimuli created using the articulatory synthesizer VTCalc (Maeda 1982), and simulating different degrees of lip rounding and protrusion of high back vowels.
• 9 stimuli x 4 repetitions.

Listeners
• 16 native listeners of French from mainland France.

Protocol
• Identification: multiple forced choice (10 oral and 4 nasal vowels of French).
• Rating: 1-5 (good exemplar or not?)

Results: identification
16 French listeners

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Concluding remarks
• French /u/ pronounced by Japanese-speaking learners was mainly perceived as /ø/ by native listeners of French.
• High back unrounded vocoids were mainly perceived as /œ/ or /ø/ by native listeners of French.
• These findings confirm the small acoustic distance between front rounded and back unrounded vowels.

References