



Researching phonological variation in child, learner and adult speech – the case of schwa in French

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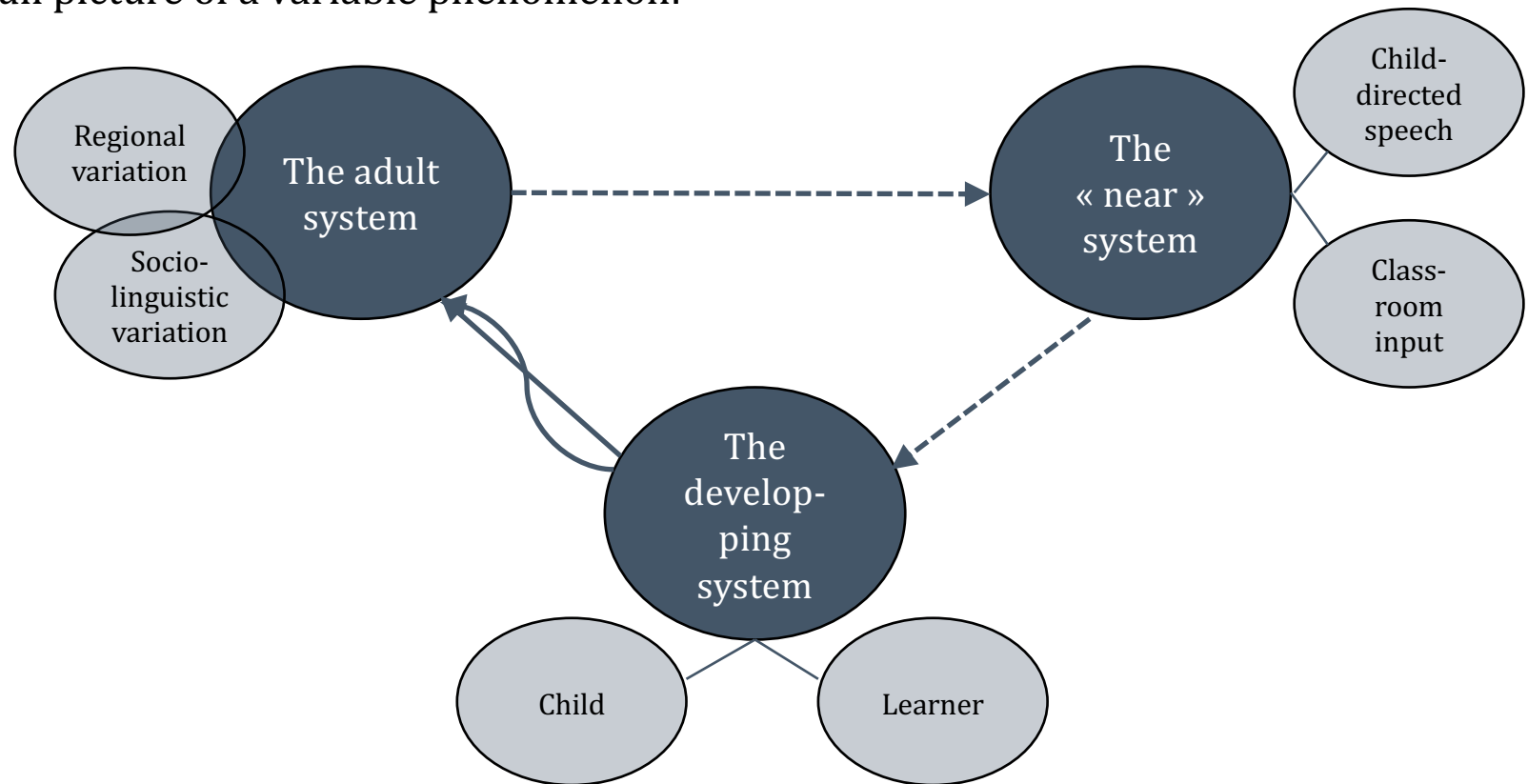


The challenge

- To fully understand a linguistic phenomenon
 - Formulate research questions and hypotheses.
 - Collect the necessary type and amount of data.
 - On the basis of the results, identify all influencing factors.
 - Place the analysis in a bigger picture.
 - Account for the observed pattern(s) within a model.
- Additionally, to fully understand a linguistic variable
 - Is the observed variation conditioned or free?
 - Is the observed variation attested across the speaker population (narrowly or broadly defined)?
 - For acquisition studies: Is the observed variation target-like or developmental?

The challenge

- To get the full picture of a variable phenomenon:



The challenge exemplified

- **French schwa** can surface as a vowel [œ] or be absent from the phonetic output of the word without changing its meaning.



*Alors là, oui d'accord, mais mais mais la **seconde**, oui la **seconde** partie du jeu est une partie de de calcul purement mental. (Andreassen & Lyche, 2004, svarv1, informal conversation)*



seconde 'second;F'

[sœgõd] with schwa

[sgõd] without schwa

The questions

By definition, a phonological variable triggers the production of more than one variant in the output.

1. To what extent can a phonological variable display different behaviours across different speaker groups?
2. How to proceed to capture this variability?
 - a) Methods
 - b) Analytical tools



Outline

- Phonological variation
 - Its place in grammar
 - Acquisition
- Phonological variation illustrated: French schwa
 - Schwa in adult French L1
 - Schwa in child French L1
 - Schwa in learner French
- Summary

Phonological variation

«[A]cquisition of phonological variation» is equivalent to talking about «acquisition of windows» when buying a house.

(Kerswill & Shockey, 2007, p. 66)

Phonological variation

- Can be defined as «a situation in which a single morpheme can be realized in more than one phonetic form in a single environment» (Coetzee & Pater, 2011, p. 401)
- May involve
 - Phonological features
 - Sub-categorical distinctions/phonetic features (phonetics-phonology interface)
 - Suppletion (morphology-phonology interface)

Phonological variation

Modelling

- Partially ordered constraints (Anttila, 1997)
 - Set of constraints subject to variable order → the different rankings yield different outputs (= variants).
- Exemplarism (e.g. Pierrehumbert, 2001)
 - Traces of all instances: Every instance of a word is stored and classified according to the exemplars already stored.
 - Captures more easily frequency effects.
- Stochastic Optimality Theory (Boersma, 1998; Boersma & Hayes, 2001)
 - Generalisations based on exemplars.
 - Continuous learning process where stochastic constraints are continuously updated.

Phonological variation in L1 acquisition

- Labov (1989): If the acquisition of phonological variables is governed by innate principles, then articulatory constraints should, by definition, be acquired before stylistic and social constraints.
- Kerswill (1996): The time of acquisition of a feature depends on the linguistic level, the complexity of the conditioning, and the child's age.
- Smith et al. (2007): The presence or absence of overt stylistic regulation in the input might have a direct effect on the child's mastery of stylistic constraints.

Phonological variation in L2 acquisition

- General proficiency level plays a role.
- Underuse of informal variants in favour of more formal ones → due to limitations of the classroom.
- Immersion, including native-speaker contact, has a positive, yet not optimal, effect on the acquisition of variables.
- Social integration has in some cases proven to have a highly positive effect, with minimal differences compared to native speakers.

French schwa

- Definition

- Alternation between \emptyset and vowel in the same lexical and morphological context (Côté, 2000; see also Dell, 1985[1973]).

- Distribution

- Two contexts with variation: Initial syllable of polysyllables and monosyllables, post-vocalically.

mon petit ami [mõpœtitami] ~ [mõptitami]

tu me dis [tymœdi] ~ [tym.di]

tout ce que [tusœkœ] ~ [tu.skœ]

- In word-medial and word-final syllables: Stable, predictable presence and absence.

doucement ~ *autrement* [dusmã] ~ [otrœmã]

nette ~ *notre* ~ *notre père* [nɛt] ~ [nɔtʁ] ~ [nɔtʁ(œ)pɛʁ]

French schwa

- The behaviour of schwa in adult French has served as testing ground for a wide range of theoretical frameworks in the last 50 years.
- Aspects most frequently studied:
 - Phonological alternation between vowel and zero, e.g. *seconde* ‘second;F’ [sœgɔ̃d] ~ [sgɔ̃d]
 - Phonetic confusion with stable /œ/, e.g. schwa in *Genève* [ʒœnɛv] ~ [ʒnɛv] vs. stable /œ/ in *jeunet* ‘very young’ [ʒœnɛ] ~ *[ʒnɛ]
 - Stylistic constraints, e.g. higher level of schwa presence in more formal situations, such as reading.

French schwa

- Schwa and acquisition: A research topic currently gaining interest
- Until some years ago: No phonological analyses available.

“part of the reason [...] may well be that the conditioning factors surrounding variable schwa are not exclusively phonological – a not inconsiderable role is played by other factors such as style, register, formality and sociolinguistic context” (Hannahs, 2007, p. 69)

(for other approaches, see Thomas, 2002, 2004; Uritescu et al., 2004, Stridfeltdt, 2005)

Data in schwa research

- Classical works, which attempt to present the system and account for it theoretically, refer to “standard French” (and introspection?).
 - Descriptive works: Fouché (1956)
 - Theoretical works: Schane (1968), Dell (1985[1973])

[C]ette variété de français serait particulièrement bien décrite et assurerait une base empirique exceptionnelle pour la formulation de généralisations théoriques [... une] démarche [...] légitime, si l'on comprend bien la limite de ces témoignages. (Morin 2000, p. 104)

Data in schwa research

- With the new millennium: Tool & methodology development → new areas of investigation
 - Experimental data (lexical representations and preferential patterns)
 - Corpus data (inter- & intra-speaker variation)
 - Phonetic data (phonetics-phonology interface)

Researching schwa by combining data

The two questions repeated

1. To what extent can a phonological variable display different behaviours across different speaker groups?
2. How to proceed to capture this variability?
 - a) Methods
 - b) Analytical tools

Speech in three populations to be examined

- Adult French L1
- Child French L1
- Learner French

Schwa in adult French L1



Schwa in adult French L1: The project

The screenshot shows the website for the Phonologie du Français Contemporain (PFC) project. The header includes navigation links: ACCUEIL, PROTOCOLE, ENQUÊTES, CORPUS, REQUÊTES, OUTILS, IPFC, PFC-EF, COLLOQUES, PUBLICATIONS, ÉQUIPE, HISTORIQUE, BULLETINS PFC. The main title is "PHONOLOGIE DU FRANÇAIS CONTEMPORAIN (PFC) : USAGES, VARIÉTÉS, STRUCTURE". Below the title, there is a search bar and a user greeting: "WELCOME HELENE N. ANDREASSEN". The page is divided into two main sections: "PFC RECHERCHE" and "PFC ENSEIGNEMENT". The "PFC RECHERCHE" section includes links for "ACCES À LA BASE DE DONNÉES", "CORPUS PUBLIC", and "CORPUS RECHERCHE". The "PFC ENSEIGNEMENT" section includes links for "LE PROJET PFC-EF", "PARTICIPANTS", "LE FRANÇAIS ILLUSTRÉ", "LE FRANÇAIS EXPLIQUÉ", "RESSOURCES LINGUISTIQUES", and "RESSOURCES DIDACTIQUES".

PHONOLOGIE DU FRANÇAIS CONTEMPORAIN (PFC) : USAGES, VARIÉTÉS, STRUCTURE

PFC (Phonologie du Français Contemporain) est un programme de recherche offrant une base de données de français oral contemporain dans l'espace francophone. Il s'adresse à un triple public :

- **chercheurs** : phonétique, phonologie, syntaxe, pragmatique, sociolinguistique, analyse conversationnelle, etc.
- **enseignants/apprenants de français** : langue étrangère, première ou seconde
- **grand public** : intéressé par les accents du français ou par le patrimoine linguistique francophone en général

Le corpus PFC contient plus de 50 enquêtes (soit plus de 400 locuteurs). Une sous-partie de ce corpus (16 enquêtes, soit 164 locuteurs) a été anonymisée et publiée en ligne sur le site PFC et Ortolang. D'autres enquêtes sont actuellement en cours de traitement.

En 2008, PFC s'est élargi aux apprenants de français langue étrangère dans le sous-projet Interphonologie du Français Contemporain (IPFC). Le sous-projet PFC-Enseignement du Français (PFC-EF), lancé en 2006, est destiné à l'exploitation pédagogique du corpus PFC.

CONDITIONS D'UTILISATION:

Les données présentées sur ce site sont issues du projet PFC et restent la propriété exclusive des auteurs représentés par les directeurs du projet. Elles ne peuvent être reprises et utilisées

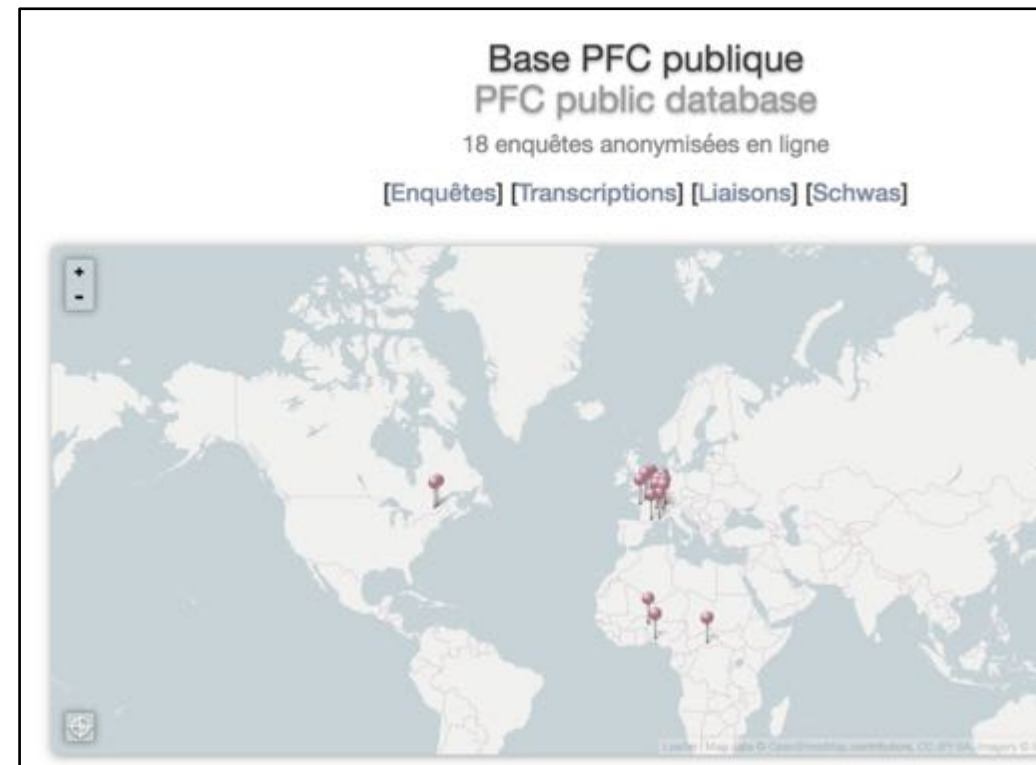
Objectives

- Provide a better picture of spoken French (similarities and differences).
- Test phonological and phonetic models (synchronic and diachronic dimensions).
- Join phonological knowledge and tools for automatic treatment of language.
- Allow conservation of the linguistic patrimony in the Francophone world.
- Encourage renewal of data and analyses for the teaching of French.

(Durand et al. 2002, 2009)

Schwa in adult French L1: Methods

- Hypotheses
 - Positional and phonotactic patterns.
 - Regional variation, sociolinguistic variation.
- Methods
 - Wordlist, text reading, interview, free conversation (inspired by Labov, 1972).
 - Network principle (Milroy, 1980).
- Database
 - More than 50 investigation points (400+ speakers)
 - At present, 18 investigation points openly available, cf. www.projet-pfc.net



Schwa in adult French L1: Observations

- **Southern French:** An exception
 - No alternation in initial and medial syllables of polysyllables: Stable vowel (not schwa)
 - No alternation in word-final position (incl. monosyllables), except in front of vowel: Schwa
- Dialect levelling in process
 - Douzens & Lacaune (villages, labelled “conservative French”): Stability in all positions.
 - Marseille, Aix-Marseille & Biarritz (cities): Variation in word-final position, some in word-medial, with the younger generations leading the change.

| | Word-medial | Word-final |
|---------------|----------------|-----------------|
| Douzens | 94,9% (94/99) | 78,7% (420/533) |
| Lacaune | 97% (63/65) | 78,8% (328/416) |
| Aix-Marseille | 74,5% (44/59) | 19% (44/232) |
| Marseille | 65,2% (62/95) | 17,3% (62/357) |
| Biarritz | 71,8% (97/135) | 26,4% (168/636) |

(Lyche, 2016, p. 356-357)

Schwa in adult French L1: Observations

- **European French (≠ South):** Similar behaviour of schwa in monosyllables and initial syllables of polysyllables across the varieties, with ~30% schwa presence in both positions.

| | |
|--------------|----------------|
| Brécey | 34,4% (60/174) |
| Treize-Vents | 18,2% (18/99) |
| Ogéville | 26% (28/108) |
| Brunoy | 30,6% (53/173) |
| Paris-centre | 37,2% (44/118) |

Behind the numbers:

- Local differences in rates of schwa alternation for different types of words.
- Local differences in application of alternation vs. stable presence/absence.

- Higher level of schwa deletion in monosyllables in the younger generations → due to speech rate?
- **Canadian French:** More constrained variation, with no alternation in a large amount of words, though with local variation: More alternation in Quebec than in Montréal.

Phonology-phonetics interaction

- Phonetic reduction (Bürki et al., 2011)
 - Like other vowels in French, schwa is subject to phonetic reduction in continuous speech.
 - Temporal reduction: 14% of the corpus only a short portion of voicing, 30 ms duration, with formant structure (radio broadcast corpus).
 - Spectral reduction: little schwas more susceptible to assimilate to adjacent consonants.
- Perception of phonetic reduction (Bürki et al., 2011)
 - Classification challenge
 - The little schwas subject to intra- and inter-judge disagreement.
 - Other factors than the acoustic characteristics influence the classification, e.g. speech rate, word duration, segmental context.

Inter-regional study in Switzerland

- **Methods**

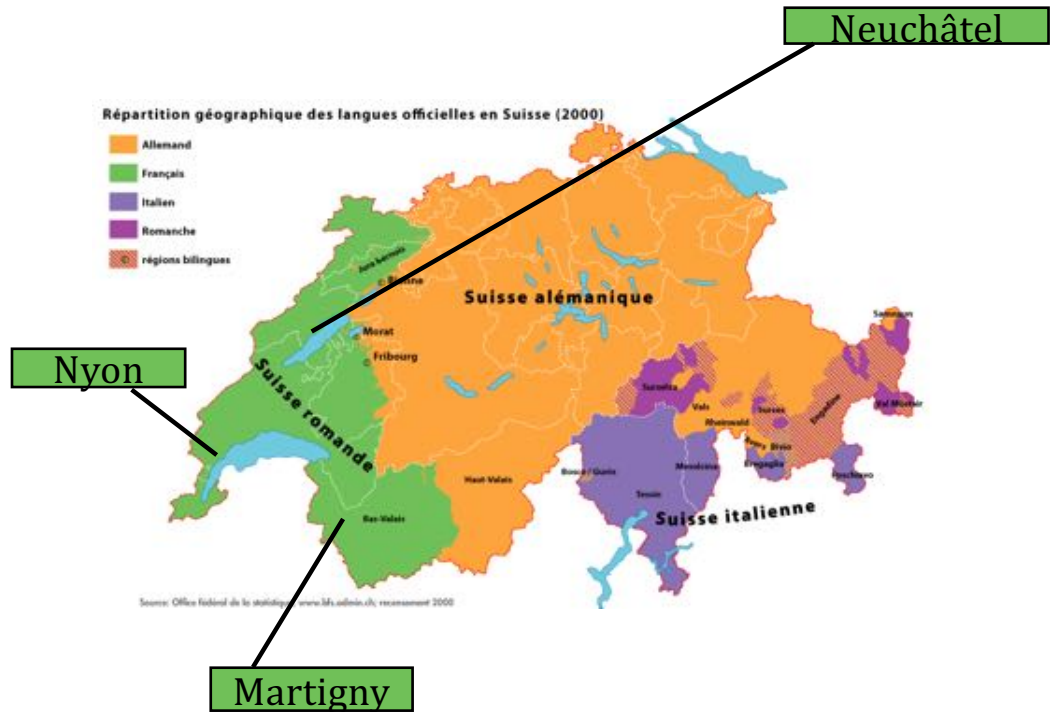
- 3x12 speakers from the PFC investigation points Nyon (VD), Neuchâtel (NE) and Martigny (VS).
- Extraction of all potential schwas in the initial syllable of polysyllables.
- Extraction of word duration and schwa duration.

- **Results**

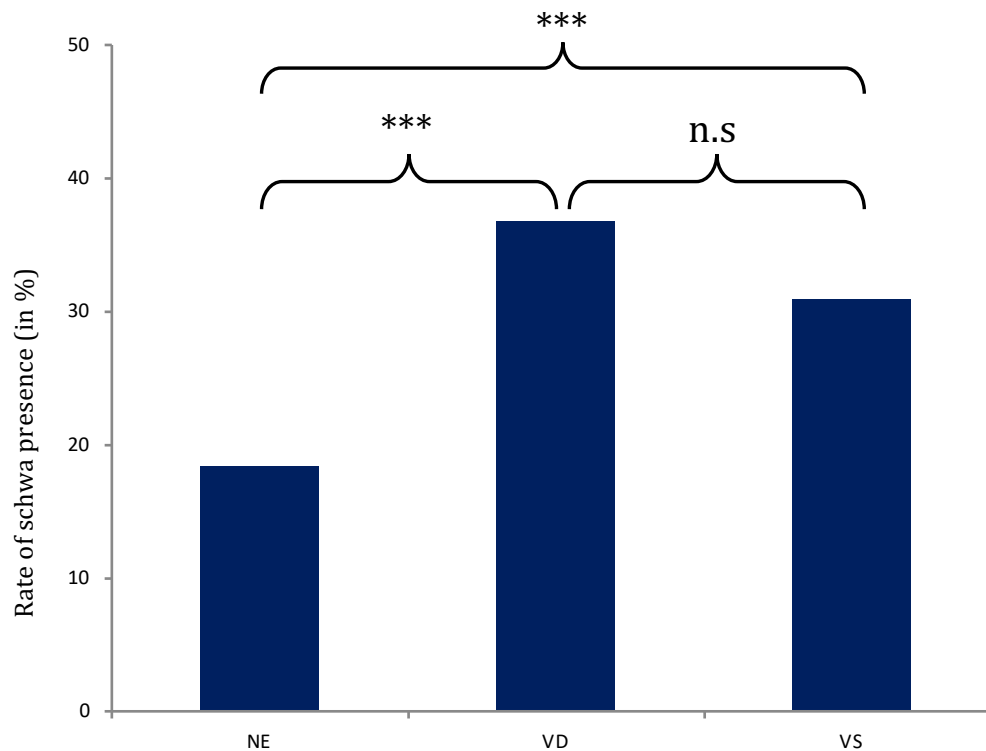
- 579 polysyllables with a potential schwa.
- Mean level of schwa presence: 29,02%.
- Mean schwa duration: 19,39% of word duration.

- **Questions**

- **Does the rate of schwa presence vary across regions?**
- **If schwa is present, does schwa duration vary across regions?**



Rate of schwa presence

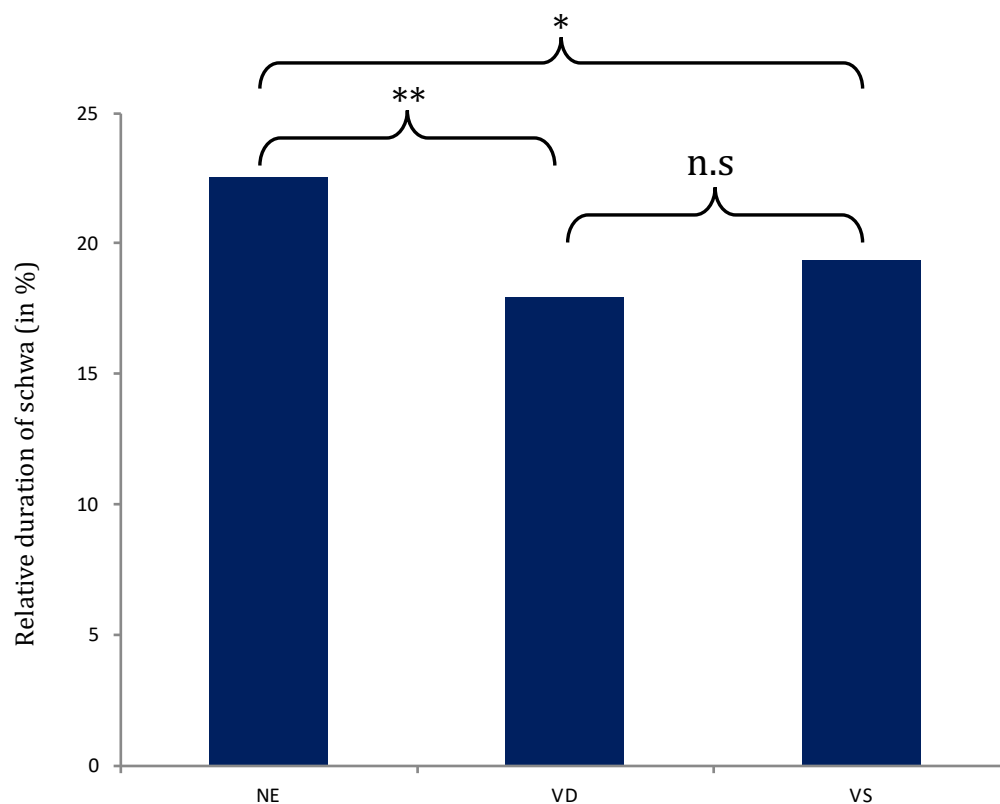


Higher level of schwa presence in the speakers from Vaud and Valais than in those from Neuchâtel

Regional effect
($p < 0.001$)

Rate of schwa presence (in %) in terms of the speaker region (NE, VD and VS, $n=579$)

Schwa duration

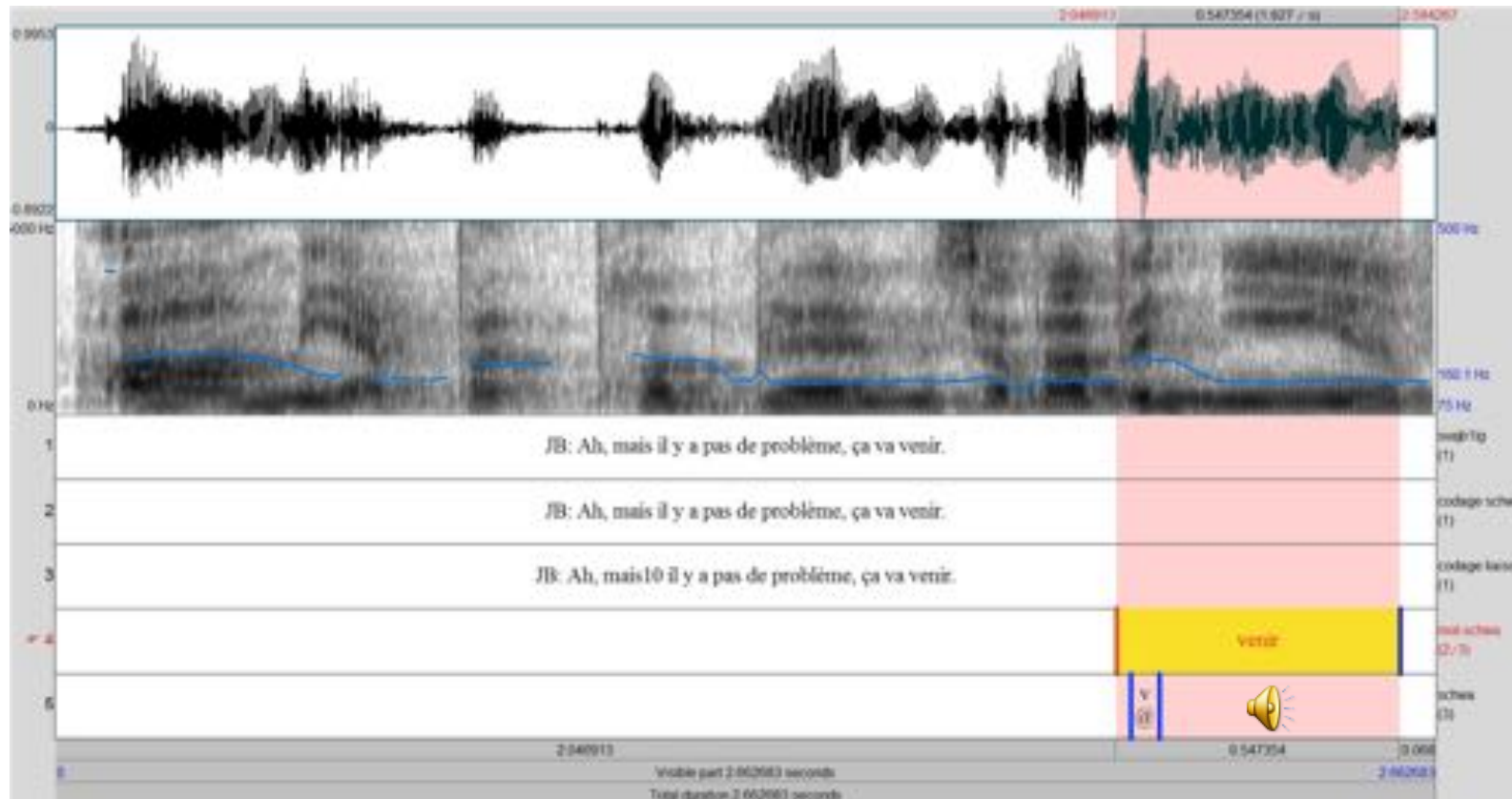


Shorter schwas in the speakers from Vaud and Valais than in those from Neuchâtel.

Regional effect
($p < 0.01$)

Relative duration of schwa (in %) in terms of the speaker region (NE, VD and VS; $n_{NE}=32$, $n_{VD}=68$, $n_{VS}=68$)

Example Nyon (VD)



Relative schwa
duration:
10,47%

Example Martigny (VS)



Relative schwa duration:
5,64%

Fine-grained inter-regional variation

- Higher rate of schwa presence in the Nyon (Vaud) and Martigny (Valais) speakers compared to the Neuchâtel speakers.
- Shorter schwas in the Nyon and Martigny speakers than in the Neuchâtel speakers

Interpretation

- Schwa alternation traditionally characterised as a categorical process, with the articulatory target either present or absent in the signal.
- Like the big schwa, the little schwa preserves the CVCV prosodic structure.
- In contrast to the big schwa, the little schwa is harder to perceive.
- The little schwa does not seem to have any communicative function, rather a structural one.
- **Conclusion: The prosodic CVCV structure is more important in Nyon and Martigny than in Neuchâtel, but these speakers have phonetic tools available to reduce the saliency of the schwa in the signal.**

Phonological variation

Insights from adult French L1

- Schwa behaviour
 - Sociolinguistic variable, at least to a certain extent.
 - Inter- and intra-regional variation in rates of alternation.
- Schwa at the phonetics-phonology interface
 - Schwa duration varies.
 - Inter-regional variation in temporal implementation of schwa.
 - Interaction between segmental and suprasegmental level?

Schwa in child French L1



The output variants of schwa alternation_{repeated}

For each word with schwa, two grammatical and interchangeable output variants:

- [CœC] with schwa presence
- [CC] with schwa absence and a secondary consonant cluster (Bazylko, 1976)

- Scarce overlap between primary and secondary consonant clusters in French.

On doit pas tirer sur les, les [fm]elles, hein ...

(scapy1, interview)



Et on avait des [dgʁ]és encore après

(scajb1, interview)



Quand j'étais à [zn]ève, on me [fz]ait bien [ʁm]arquer certaines fois que j'avais l'accent neuchâtelois.

(scacy1, interview)



A schwa in child language

Image: Beaumont & Michelet (1998)

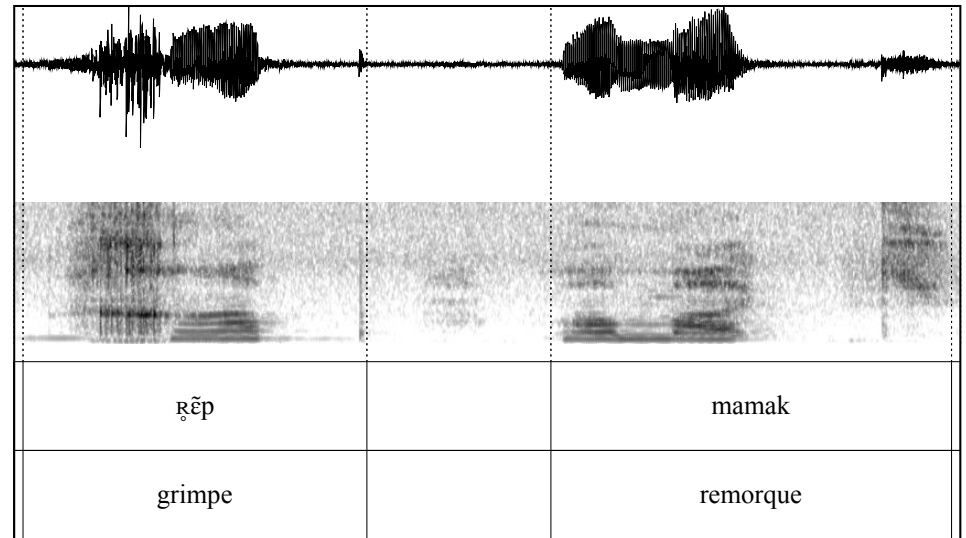


grimpe remorque 'climb;prs trailer'

[ɡʁẽpʁ(œ)mɔʁk] → [ʁẽpmamak]



Henri 2;06.05



- Target schwa present
- Target schwa realised [a]
- Consonantal context modified [ʁVm] → [mVm]

Constraining production abilities

- Phonological constraints
 - Rounded vowels, e.g. *bleu* 'blue' [blø] → [pǎle] (Adèle 2;07.08)
 - Consonant clusters, e.g. *train* 'train' [tʁɛ̃] → [tæ] (Kim 3;00.05)
 - Syllable deletion, e.g. *petit* 'small;M' [pti] → ['a'ti] (Fabienne 2;03.19)
- Prosodic constraints
 - Child-specific prosodic prominence on non-final, target non-prominent, syllables, e.g. target [ʃ(œ)] in *cheval* ['fɛ'vaj] (Henri 2;04.29) vs. [ʃœ'val] (Guy 3;04.26)
- Articulatory constraints
 - Production and timing of secondary consonant clusters, e.g. target [sk] in *secoue* 'shake;3SG' [sɪku] ~ [θku] (Guy 3;04.26/3;06.14)

Examining child speech early: The impact of the acquisition of reading skills

- Test subjects: 22 non-readers (5;01-6;00 years old), 21 readers (9;00-10;06 years old)
- Task: Identify embedded schwa-items
- Results
 - Schwa-items "renard": Variant with schwa recognized more rapidly in both groups
 - Pre-readers influenced by the usage of the variants.
 - Readers show a stronger distinction: Reading skills strengthen the variant with schwa.
 - Schwa-items "bracelet"
 - Non-readers: Variant with schwa recognized less rapidly. No vowel in oral input.
 - Readers: No distinction. Influenced both by usage (∅) and by orthography (<e>).
- **The results indicate modifications of the lexical representations during acquisition of reading skills.**

Schwa in child French L1: The project

Three areas for research questions

- **Categorisation:** Establishment of the category schwa.
- **Variation:** Distribution of vowel-zero alternation in the initial syllable of polysyllables.
- **Phonotactics:** Creation and prosodification of secondary consonant clusters.

Goals

- **Empirical goal:** Examine the child's production of schwa-items while taking into account the child's relative mastery of consonant clusters and non-prominent syllable deletion.
- **Theoretical goal:** Place schwa alternation in the development of the whole language system.

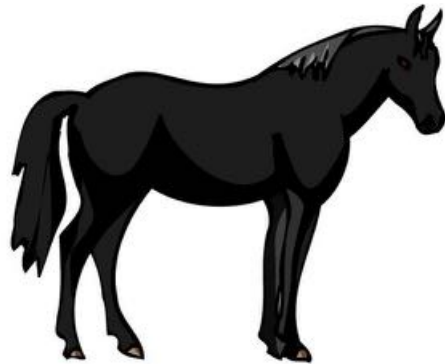
Schwa in child French L1: Methods

- Data needed
 - Several occurrences of different schwa-items.
 - The child's production of the two target variants (if available).
- The shortcoming of different collection methods
 - Spontaneous speech does not ensure multiple occurrences, nor comparable data.
 - Semi-controlled speech does not ensure production of natural alternation rates.
 - Combination is the optimal solution.
- To see the importance of the input, we also need to obtain child-directed speech
 - Spontaneous
 - Semi-controlled

| Group | Name | Sex | 1st session | Final session | Mother | Spont. | Test |
|-------|----------|-----|-------------|---------------|-----------|--------|------|
| 1 | Fabienne | F | 2;02.15 | 2;05.21 | | 6 | 5 |
| 1 | Henri | M | 2;04.01 | 2;07.08 | | 7 | 5 |
| 2 | Lucas | M | 2;07.01 | 2;10.25 | Véronique | 16 | 5 |
| 2 | Adèle | F | 2;07.08 | 2;10.13 | Valentine | 12 | 5 |
| 2 | Janice | F | 2;07.27 | 3;00.14 | Nina | 15 | 6 |
| 2 | Kim | M | 2;08.29 | 3;00.05 | | | 5 |
| 2 | Théa | F | 2;09.29 | 3;01.12 | | | 5 |
| 3 | Armand | M | 2;11.13 | 3;04.03 | Karoline | 17 | 6 |
| 3 | Lambert | M | 2;11.13 | 3;03.02 | | | 5 |
| 3 | Eric | M | 2;11.16 | 3;02.15 | | | 5 |
| 3 | Albert | M | 3;01.00 | 3;04.03 | | | 5 |
| 3 | Tom | M | 3;01.17 | 3;06.05 | Blanche | 19 | 6 |
| 3 | Guy | M | 3;02.14 | 3;07.06 | Alice | 16 | 6 |

(Andreassen, 2013)

Semi-controlled input



Tu peux
me dire
ce que
c'est?

De chevaux
[søvaj]

C'est deux
chevaux
[jvo]
rouges?

Un cheval
[θøvaj] puis un
cheval [svaj]
vert

C'est un cheval
[jval] noir et un
cheval [jval]
blanc

Un cheval [fã]
noir un cheval
[pa] blanc

Schwa in child French L1: Observations

- In the majority of cases, the child, regardless of his age, favours one variant per schwa-item.
 - Phonological alternation not authorised/not freely employed.
- High degree of schwa presence across the corpus.
 - Schwa-items used by children are subject to highly frequent schwa absence in the target language, thus mismatch between child and adult speech.

*Il y avait des gens qui **faisaient** de la musique?* [fzɛ]
'There were people playing music?' Blanche (mother of Tom)

*Non, mais il **faisait** quoi?* [fœzɛ]
'No, but what did he do?' Tom (3;06.05)

Schwa in child French L1: Observations

- Schwa-items, also those with similar phonotactic structure, behave somewhat differently across and within children.

- Variation across children

*La jeep elle est **venue***

[vny]

'the jeep has arrived'

Guy (3;05.30)

*Est **venu** moi*

[vuny]

'I have arrived'

Armand (3;03.20)

- Variation within a child

*Un puzzle avec un **cheval***

[tɔval]

'A puzzle with a horse'

Adèle (2;09.23)

*C'est le shampooing pour laver les **cheveux***

[sjø]

'It's shampoo for washing the hair'

Adèle (2;08.22)

Schwa in child French L1: Observations

- Spontaneous target-like schwa alternation mainly observed in the phonologically more advanced children.



*Ouais, après elle les **remet***

[ʁʁmɛ]

'Yeah, afterwards, she put them back on'

Tom (3;06.05)



*... et puis après il la **remet***

[ʁmɛ]

'... and afterwards, he put it back on'

Tom (3;04.19)

- **Schwa alternation is gradually acquired, seemingly in part constrained by type of [CC]: secondary clusters with initial [ʁ] produced slightly less than other types of secondary clusters.**

Schwa in child French L1: Observations

- All children show a certain degree of sensitivity to the variants produced in the input.
 - Selection of the non-preferred variant after exposure to this variant is particularly observed in the phonologically more advanced children.

*Ça c'est un **cheval***

'That is a horse'

[ʃœval]

Albert (3;01.00)



*Oui, c'est un **cheval**. Et puis ça c'est quoi?*

'Yes it's a horse. And this is what?'

[ʃval]

Vaudois speaker

*Un **cheval** qui court*

'A horse that runs'

[ʃvaj]

Albert (3;01.00)

Schwa in child French L1: Observations

- For children who do not (fully) master secondary clusters, we observe non-target-like outputs
 - Cluster reduction
 - C₁ in *fenêtre* 'window' [vɔ̃vɛɔ] ~ [fɛ:t] Henri (2;04.29)
 - C₂ in *fenêtre* 'window' [fɥnɛt] ~ [nɛ] Armand (3;01.21/3;00.01)
 - Cluster modification
 - Gliding in *cheval* 'horse' [təvat] ~ [fwat] Adèle (2;08.29)
 - Assimilation in *fenêtre* 'window' [fœnɛtʁ] ~ [ɲnɛtʁ] Guy (3;03.22)

Schwa in child French L1: Observations

- Other non-target like outputs that indicate the importance of the initial syllable



- Consonant deletion

moi refais moi refais [ma ɔfɛ ma ɔfɛ]

Adèle 2;09.16



- Vowel doubling

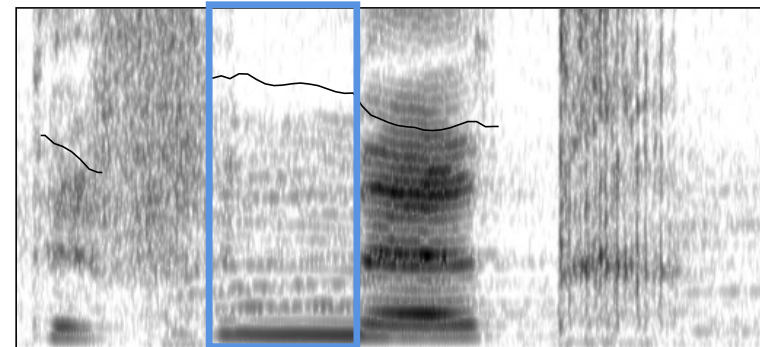
des fenêtrés [ə vɛɛtʁ]

Armand 2;11.21

- Syllabic sonorant

des fenêtrés [fɛ̃nɛtʁ] [f.nɛtʁ] [fɛ̃nɛtʁ]

Tom 3;03.30



Interpretation

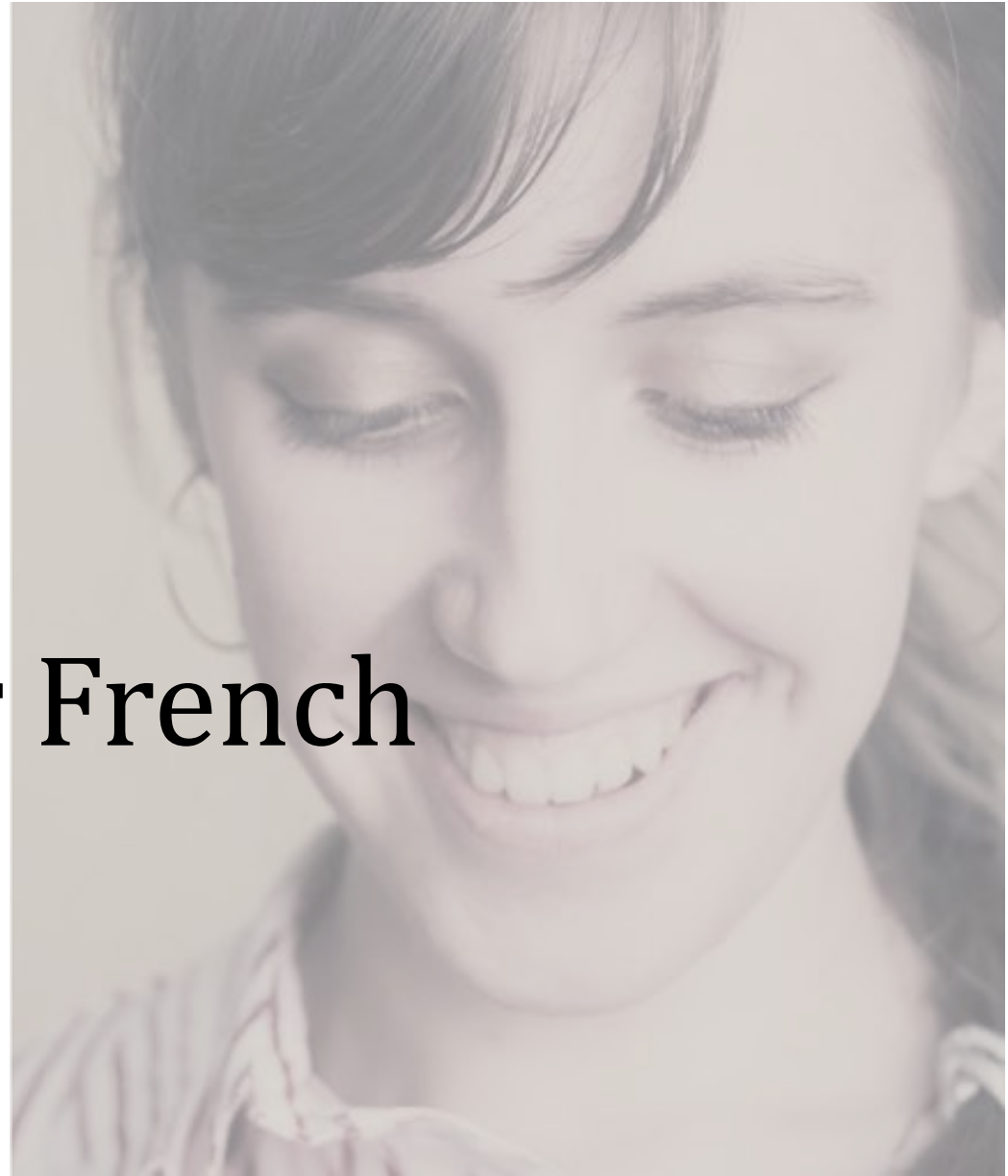
- Schwa alternation hindered by suprasegmental structure
 - Strong faithfulness to the schwa syllable, once it is part of the lexical representation.
 - Schwa is realised with non-target-like qualities.
 - Schwa is realised even when surrounding consonants are deleted.
- Schwa alternation hindered by phonotactics
 - Schwa alternation is not mastered before secondary clusters are in place.
 - Secondary clusters are not mastered before primary clusters are in place.
 - The rare instances of the schwa-less variant in the semi-controlled setting are modified in line with the child's current knowledge of phonotactics.

Phonological variation

Insights from child French L1

- Schwa behaviour
 - Early sensitivity to schwa alternation in input.
 - Despite alternation in the input, strong preference for vowel presence in the spontaneous output.
- Schwa alternation constrained by the developing grammar
 - Phonotactic constraints
 - Prosodic constraints
- The underlying representation of schwa
 - Schwa seems more subject to variation in quality than other vowels → indication of a less specified representation or a mere reflection of the challenge of mastering front round vowels?

Schwa in learner French



Challenges for the learner

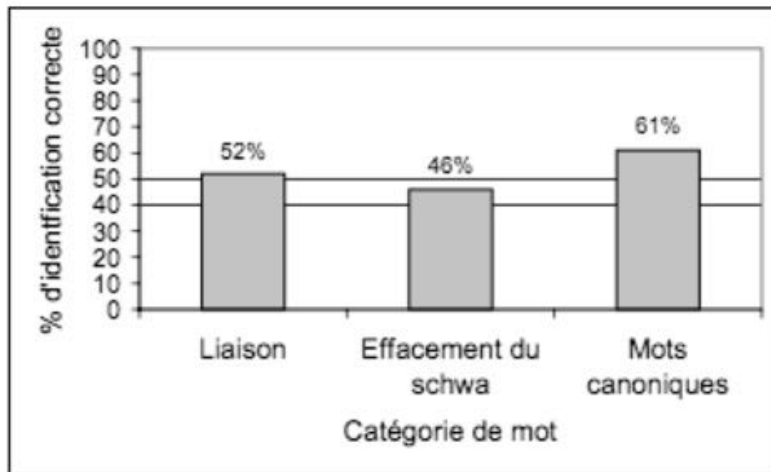
1. **Comprehension:** Coexistence of variants for a given word. Syllabic reorganisation which removes the lexical/syllabic alignment.
2. **Orthography-phonology correspondence:** Influence of the orthographic representations, especially problematic for L1s where there is a strong correspondence.
3. **Production:** Handle variation (presence/absence of schwa) and produce complex consonant clusters.
4. **Stylistics:** Schwa deletion very frequent in colloquial French. “There are cases where speaking French too well amounts to speaking it badly.” (Pohl, 1975, p. 23, referred to by Thomas, 2004, p. 380).

(Thomas, 2004; Uritescu et al., 2004; Nouveau & Detey, 2007)

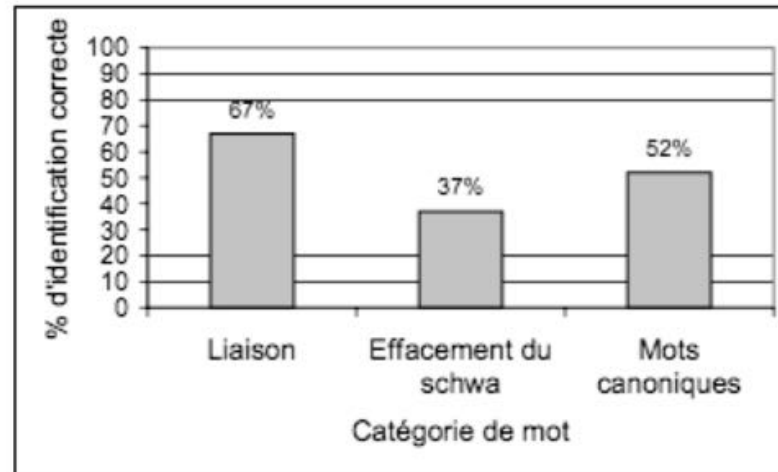
Perception of schwa alternation

Swedish learners of French:

In word recognition, schwa absence complicates perception.



Global results, perception of speaker 1



Global results, perception of speaker 2

Perception of schwa alternation

Swedish learners of French:

In word repetition, higher degree of schwa presence in familiar words.

→ Target variant frequency not reflected

→ Reconstruction based on lexical representation with schwa?

| Prononciation de la locutrice | Prononciation des apprenants | | | |
|----------------------------------|------------------------------|------|----------------------|----|
| | Mots familiers | | Mots moins familiers | |
| | SE | AE | SE | AE |
| AE et RD | 71 | 29 | 50 | 50 |
| AE et RG | 62,5 | 37,5 | 45 | 55 |

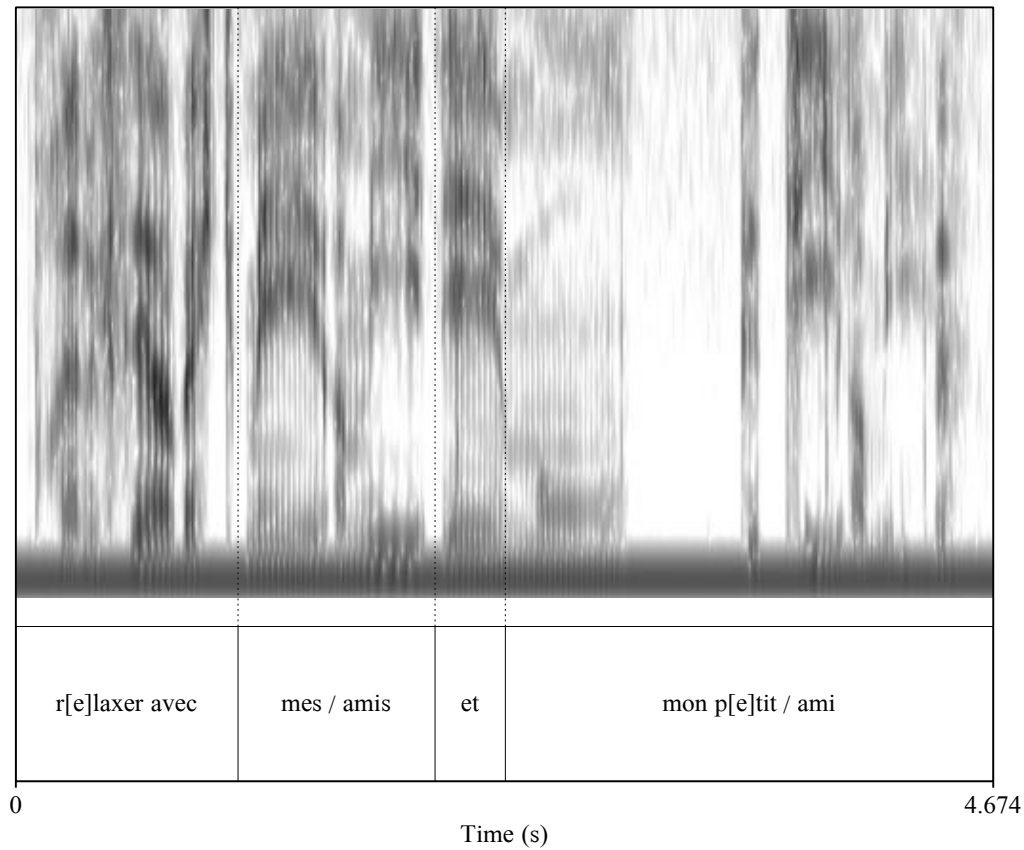
AE = avec effacement

SE = sans effacement

RD = rattachement à droite

RG = rattachement à gauche

A Norwegian learner of French



(Andreassen & Lyche, to appear, notrah1, semi-formal conversation)

Prosody as a complicating factor for production

Norwegian lexical stress

- Falls within the last two-syllable window of the word.
- Falls on the final syllable if this is heavy, and on the penultimate syllable if the former is light (Kristoffersen, 2015).

Norwegian accent phrase

- The stressed syllable appears at its left boundary.
- Includes all unstressed syllables following the stressed syllable.
- Since stress is not systematically word initial, the accent phrase does not systematically respect lexical boundaries. (Kristoffersen, 2000).

Tasks for the Norwegian learner of French

- **Not to stress individual lexical items.**
- **Link several lexical items as if they were one word, with stress on the final syllable of the rhythmic group → Create the conditioning context for schwa alternation.**



Schwa in learner French: The project

Interphonologie du Français Contemporain (IPFC)

IPFC

Actualité
Cadre IPFC
Participants
Descriptif
Corpus
Références
Thèses et Mémoires
Projets IPFC
IPFC-allemand
IPFC-anglais canadien
IPFC-espagnol
IPFC-grec d'origine
IPFC-taïwanais
IPFC-japonais
IPFC-néerlandais
IPFC-norvégien
IPFC-portugais brésilien
IPFC-soudanais
IPFC-turc
Colloques
IPFC2011-Paris
IPFC2011-Tokyo
IPFC2010
Sites partenaires

What's New

2012.07.20 Références
2012.07.11 Colloques
2012.06.25 IPFC-espagnol
2012.06.22 Projets IPFC
2012.06.20 IPFC-japonais

Bienvenue sur le site du projet IPFC (Interphonologie du français contemporain), piloté par:
Sylvain Detez (Université Waseda & Université de Rouen)
Isabelle Racine (Université de Genève)
Yuji Kawaguchi (Tokyo University of Foreign Studies)
Jacques Durand (Université de Toulouse & IUF)

Ce projet est dédié à l'étude des systèmes phonéico-phonologiques des locuteurs non-natifs du français, pour lesquels le français est une langue étrangère (FLE) ou seconde (FLS). Il s'agit donc de populations d'apprenants qui peuvent faire usage du français dans diverses situations et appartenent de ce fait au monde francophone.

Par interphonologie, on désigne généralement le nouveau système (phonéico-iphonologique) des apprenants d'une langue étrangère en cours de construction ou dans un état stabilisé.

Par-delà l'interphonologie, le projet IPFC concerne tous ceux qui s'intéressent à la production (et la perception) orale en français langue étrangère, puisque, à terme, le corpus IPFC devrait pouvoir être, au moins en partie, exploité pour des analyses multi-niveaux (morphologie, lexique, syntaxe, pragmatique).

- Pour une vision globale des objectifs et des enjeux du projet, consulter la section Cadre IPFC.
- Pour une vision plus précise de chacun des sous-projets de IPFC, consulter la section Projets IPFC.

Carte des enquêtes

Objectives

- Create a database for research on French as a second language, with comparable data from populations with different L1s.
- Study phonetic/phonological systems of non-native speakers of French, for theoretical and didactic purposes.
- Around 20 teams working on different L1s.

(Detez & Kawaguchi, 2008; Racine et al., 2012)

Methods

- Repetition of an L1-specific wordlist
- Reading of the PFC wordlist
- Reading of the L1-specific wordlist
- Reading of the PFC text
- Interview with a native speaker
- Free conversation between two learners

Corpus, schwa study

Informants

- Oslo: 6 speakers (proficiency level B1/B2), with longer stays in a European French speaking country.
- Tromsø: 6 speakers (proficiency level A2).

Tasks

- Interview
- Free conversation

Methods

- Transcription in Praat.
- Application of IPFC coding system for schwa (Racine et al., 2015).



Schwa in learner French: Observations

Schwa in continuous speech, global numbers

| Corpus | Total | Polysyllables | | Monosyllables | |
|--------|-------|---------------|-------------|---------------|-------------|
| | | Absence | Occurrences | Absence | Occurrences |
| Tromsø | 978 | 1,6% | 1/61 | 2% | 18/917 |
| Oslo | 793 | 9,8% | 6/61 | 6,6% | 48/732 |

Higher rate of schwa deletion in Oslo, for both positions.

Tromsø, laborious selection and organisation of content, discourse planning, affects the target prosody in a negative way → pauses → removal of condition for schwa alternation.



*Parce que euh fait la vélo ... de Nordkapp
(notrla1, free conversation)*

Schwa in learner French: Observations

Left context: polysyllables

| Corpus | Total | V# | | C# | | ### | | ## | |
|--------|-------|-------|--------|----|------|-----|-----|----|------|
| | | A | Occ | A | Occ | A | Occ | A | Occ |
| Tromsø | 61 | 2,9% | 1/35 | 0% | 0/7 | 0% | 0/1 | 0% | 0/18 |
| Oslo | 61 | 15,8% | 6/38 | 0% | 0/12 | 0% | 0/2 | 0% | 0/1 |
| Paris | | 62,7% | 74/118 | | | | | | |



Schwa absence only post-vocally, much lower rate than in L1 adult French (Lyche & Østby, 2009, p. 216).

Oslo: Frequency effect? *p'tit peu, p'tit* (noosch1)

Tromsø: Orthography effect? More than 50% produced [e].

Stability also when schwa absence in the immediate input (not examined across the corpus).

T'es resté là-bas euh deux s'maines, un mois?
Eh, trois s[e]maines
Trois s'maines, ok d'accord
 (notrbf1, semi-formal)

Schwa in learner French: Observations

Left context: monosyllables

| Corpus | Total | V# | | C# | | ### | | ## | |
|--------|-------|------|----------|------|----------|-------|---------|------|-------|
| | | A | Occ | A | Occ | A | Occ | A | Occ |
| Tromsø | 917 | 1,1% | 3/266 | 1% | 1/104 | 0,4% | 10/247 | 1,3% | 4/300 |
| Oslo | 732 | 7,3% | 34/462 | 1,6% | 2/127 | 8,3% | 4/48 | 8,4% | 8/95 |
| Paris | 1059 | 64,% | 680/1059 | 13% | 291/1059 | 39,8% | 88/1059 | | |

Oslo: More deletion after vowel than after consonant, in line with the target system.

Tromsø: Deletion in phrase-initial position primarily in one speaker (notrik1).



J' pense que le, le tout le monde, euh
(notrik1, semi-formal)

Schwa in learner French: Observations

Schwa absence in light of leftward segmental context

Tromsø

- *je*, frequent constructions *je pense, je crois*: [ʃp, ʃk]

Oslo

- Fricative > Nasal > Liquid > Plosive
- *je*, frequent constructions *je pense, je crois*: [ʃk, ʃp]
- *ne*, non-colloquial *je ne*, [n] in coda: [ʒœn]
- *le*, [l] in coda
- *de*, in front of liquid: [dl], no deletion in *que*

| Type | Absence | Occ. |
|------|---------|---------|
| ce | 89% | 104/117 |
| te | 84% | 26/31 |
| se | 79% | 55/70 |
| je | 72% | 239/332 |
| me | 69% | 69/100 |
| de | 69% | 343/495 |
| le | 66% | 225/339 |
| que | 62% | 120/194 |
| ne | 52% | 12/23 |

Schwa absence in monosyllables, after vowel,
PFC investigation points Switzerland
(Andreassen, 2013, p. 110)

The special case of plosives

Parce qu'il y a si beaucoup de touristes

(nooshi1, free conversation)



The special case of plosives

Côté (2008): Relation between the perceptibility scale of consonants and the likelihood to block schwa deletion.

Stridfeldt (2005): Swedish learners of French have difficulties perceiving reduced *de* [d].

Effect of exposure to colloquial French: L1 Allemanic speakers in immersion have a higher deletion rate, but only for monosyllables in a postvocalic context (Isely et al., 2017).

Ex: nooseh1 and nooskf1, with more than 1 year in French school

| Informant | Deletion V# | Plosive left |
|-------------|----------------|---------------|
| others Oslo | 7,3% (32/462) | 2,2% (3/138) |
| nooseh1 | 15,7% (30/79) | 20,4% (10/49) |
| nooskf1 | 27,5% (20/127) | 2,5% (1/41) |

Interpretation

- Relation between the L1 and L2 systems
 - L1 prosodic patterns clearly present in the less advanced speakers → partly explain categorical presence in polysyllables.
- Underlying representations
 - Influence from orthography: High frequency of [e] in polysyllables.
- Order of acquisition
 - No attempts of schwa absence combined with cluster modification → segmental faithfulness and markedness constraints dominate stylistic constraints on frequency of variants.

Phonological variation

Insights from learner French

- Schwa behaviour
 - Strong preference for vowel presence, also in more advanced speakers
 - Schwa alternation first occurs in monosyllables, polysyllables lagging behind
- Schwa alternation constrained by
 - L1 prosodic and phonotactic constraints
 - Experience with target input frequencies
 - Orthography
- The underlying representation of schwa
 - Not all <e> are necessarily categorised as schwa simultaneously

Summary

To what extent can a phonological variable display different behaviours across different speaker groups? How to proceed to capture this variability?

- To approach a global analysis of a phonological variable
 - Examine its behaviour in different populations, narrowly or broadly defined.
 - Identify possible influencing factors for each population.
 - Select a methodology that captures all assumed relevant factors.
 - Have an open mind, seek details that might inform on the behaviour of the variable.
- French schwa: What needs to be done?
 - Deeper understanding of inter-regional variations.
 - Further study on schwa in child language, including monosyllables.
 - Cross-linguistic studies on schwa behaviour in different L2 learner groups.
 - Additional corpora, e.g. formal L1 speech, classroom input, pathological speech.



Thank you for your attention!

Researching phonological variation in child, learner and
adult speech - the case of schwa in French

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Romanska seminariet, November 19th 2019, Uppsala Universitet



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All pictures taken from Colourbox.com if not otherwise stated.

If time: The challenge exemplified

How a phonological variable
can behave differently across
various groups of speakers

Adult speech

Je [vœg]arde la television

(svarb2g)

Alors je les [vɔg]arde pas

(svaab1g)



Child speech

Elle dit moi grande moi
[gag]e télé

(Adèle 2;07.11)



Learner speech

Je [vœg]arde le mh
fantaisie et le historique

(notrik1g)

