Production and perception during a Parisian French vowel change

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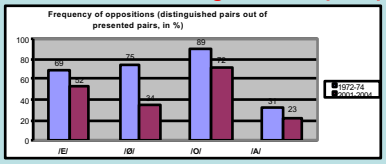
1. Production and perception in sound change

How are production and perception related during a merging process in sound change?

- Does the ability of distinguishing disappear from a speaker's perceptual device *before* he has lost it completely in his own production (Labov 1994:355) ? **OR**
- Does the perceptual distinction capability *stay intact* for some time after the speaker has himself lost the distinction in production (Janson 1983:25)?

Why look at the Parisian vowel merger /ɑ/–/a/ (pâte–patte)?



Hansen & Juillard (2011) compared young Parisian speakers recorded in 1972-74 and 2001-2004 respectively, and found that loss of distinction between two /A/ qualities was further advanced than ongoing loss of other vowel distinctions (/E/: /e/-/ɛ/; /Ø/: /ø/-/œ/; /O/: /o/-/ɔ/).

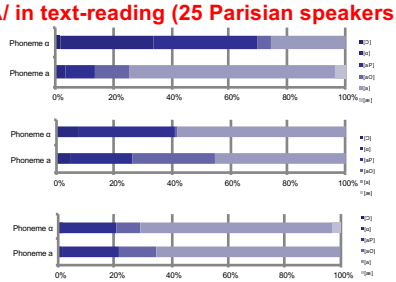
2. Production: /ɑ/-/a/ merge

Production of /A/ in text-reading (25 Parisian speakers, 2012)

2a. Age 70+

2b. Age 40-55

2c. Age 18-25



Age-grading in production shows progression of the merger. Senior speakers keep /ɑ/-/a/ apart phonetically with some consequence. Middle-aged speakers only have a slight hint of the distinction. Young speakers have completely lost it. Who can still perceive the traditional difference?

Main research question: ***How do young as opposed to middle-aged listeners react to a word identification test in which isolated words with /ɑ/ or /a/ are read aloud by a senior (conservative) speaker?***

3. Design of perceptual task

Word identification test:

Stimuli: Isolated words read aloud, by a senior reader (74 y) and a young reader (21 y) (in different orders), for written identification by 18 listeners.

The words (a total of 26 per reader after the introduction):

- Introductory words (3) to assure comprehension of the test
- Dummy words (5, *poulet, manger, kilos*..., mixed in the lists)
- Real test words with /ɑ/ or /a/ (21, *pâte, patte, hâler, aller*..., mixed in the lists)

Evaluation of the test design (I):

Total of 990 responses ((3+2x26 words) = 55 x 18 listeners).

Missing responses: 15/990 = 1,5% → **The comprehension of the test task was fine.**

Evaluation of the test design (II):

Word type	Correct word identification*	Correct vowel phoneme identification
Introductory words	91% (49/54)	-
Dummy words	99% (178/179)	-
Test words with /a/ or /ɑ/	54% (344/635)	57% (360/635)**

*Missing answers as well as a few test stimuli (*grasse/grâce; las* in one of the readings) are removed from the calculation basis here. **Wrong perception of consonants rather than of vowel phoneme disregarded here (*lacer* noted "masser" for instance), which makes the result for phoneme identification better than that for word identification.

→ **The test results reveal that words with the /A/ phoneme are harder to identify correctly than other words.**

Type of identification error on /A/	Errors on id. of /A/: N = 275
Confusion between /ɑ/ and /a/ (*pâte* noted "patte" or vice versa)	96% (265/275)
Double answer (*pâte* noted "patte/pâte")	3% (7/275)
Other error	1% (3/275)

→ **The test results reveal that identification errors on /A/ are of the expected type (confusions between /ɑ/ and /a/) .**

4. Perception and age

General – not surprising – results for *all listeners together*:

- **Receding phoneme /ɑ/ provokes fewer correct identifications than /a/ (51% (145/280) vs 61% (215/355)) (due to direction of merger)**
- **/ɑ/ phonemes of the senior reader are better identified than those of the young one (61% (85/140) vs 43% (60/140)) – due to his distinct production**

But what is the role of *listener age* in the recognition of /A/ in the senior voice?

Senior reader (aged 74)	Listeners by age group (young: 16-25 years, middle-aged: 42-62 years)	Correct phoneme identification on words with /A/
/ɑ/	Young	53% (46/86)
	Middle-aged	72% (39/54)
/a/	Young	57% (61/107)
	Middle-aged	61% (42/69)

1. **Young and middle-aged listeners react differently to the /ɑ/-phonemes of the senior reader (a success rate of only 53% correct identifications vs 72%).**
2. **Age of listener does not seem to affect recognition of the /a/-phonemes of the reader (57% vs 61% correct identifications).**

5. Conclusion

What is the relation between production and perception during this sound change?

Young listeners, who have lost the /a/-/ɑ/ difference in production, have great difficulties in identifying words in the senior voice that include the receding phoneme /ɑ/, i.e. they have almost entirely lost the ability of decoding phonetic nuances that still make (some) sense for middle-aged listeners.

It seems that if listeners' perception device *stays intact* for some time after they have themselves engaged in a process of losing a clear phoneme distinction in production (cf. Janson 1983 and the middle-aged listeners here), it weakens quickly and lasts no more than a few generations.

This study is limited – identification tests include a risk of bias through relative frequency of tested words . Further evidence will be drawn from a differentiation test (Hansen in progress).

References

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