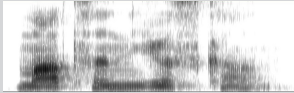# (Some) Prerequisites of priming effects in sociophonetics

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ExAPP 2016, Vienna
22.09.2016

Exemplar priming

Niedzielski 1999; Hay, Nolan, and Drager 2006; Hay and Drager 2010

method

- play identical material to subjects
- provide social information about speaker

results

- social information influences perception
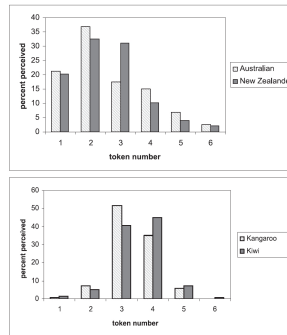- people hear Canadian (Australian) vowels when they are told the speaker is from there

Figure 5. Results for /ɛ/ from Hay et al. (2006a) (top panel), and the stuffed toy manipulation (bottom panel). Data shown are for female participants only. Lower token numbers reflect more Australian-like variants.

(Hay and Drager 2010)

Exemplar theory

Pierrehumbert 2006

acoustic input

[fɪʃ]　　　　[fiʃ]　　　　[fəʃ]

indexation

long-term memory

[fɪʃ]
- UK
- female
- 30s
- sarcastic

[fiʃ]
- AU
- male
- 40s
- excited

[fəʃ]
- NZ
- female
- 20s
- drunk
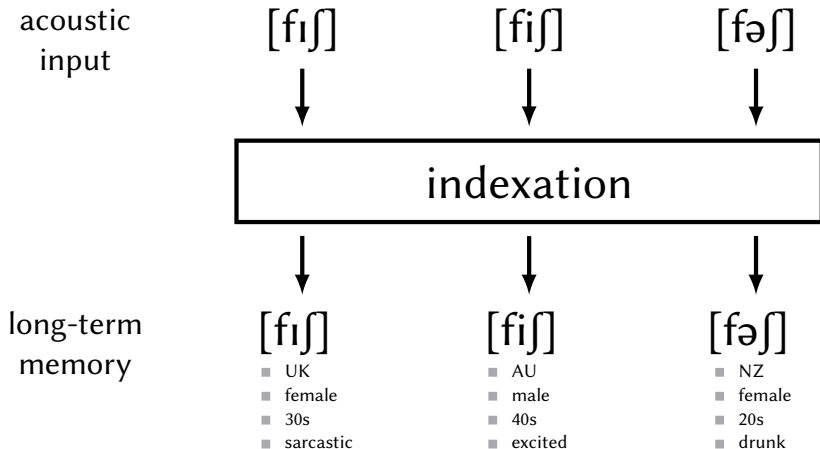
replication and theories of priming

- not all social priming studies have managed to find a significant effect (Juskan 2011; Squires 2013; Lawrence 2015)

- there is some research on the possible purpose and usage of priming, e.g. as a facilitator of conversation (Gambi and Pickering 2013) or an implicit learning mechanism (Jaeger and Snider 2007)

- on the whole, however, theories of priming are not yet advanced and sophisticated enough to tell us what counts as a "critical feature of the experimental context" and is crucial for successful replication (Cesario 2014: 43)

Salience in exemplar theory

Pierrehumbert 2006

acoustic
input

[fɪʃ] [fiʃ] [fəʃ]

attention
(salience)

indexation

long-term
memory

[fɪʃ] [fiʃ] [fəʃ]

- UK
- female
- 30s
- sarcastic

- AU
- male
- 40s
- excited

- NZ
- female
- 20s
- drunk

Main hypothesis

assumptions

exemplars containing socially salient variants...

1 ...have a higher likelihood of being remembered
2 ...are indexed with more (detailed) social information
3 ...dominate long-term memory structure

prediction

- highly salient variables will create a more pronounced priming effect in perception than less salient ones

Why Liverpool?

- Scouse is "well known to most British people, and very distinctive" (Trudgill 1999: 70)
- Scouse is among the most heavily stigmatised varieties in the UK (Montgomery 2007)

Variables

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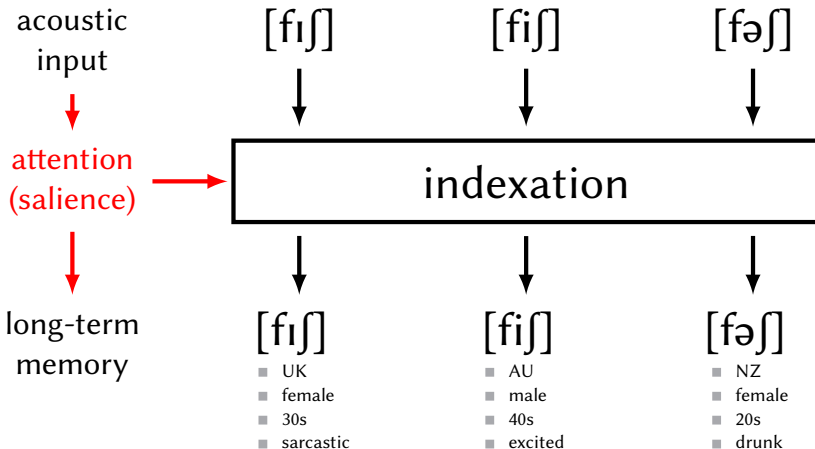Discussion
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vowels

happy-tensing
happy realised with a tense [i] instead of a lax [ɪ]

NURSE-SQUARE merger (towards [ɛ])
fair and *fur* are (near-)homophones for many Liverpool speakers

consonants

velar nasal plus
<ng> is realised as [ŋg], *singer* rhymes with *finger*

lenition of /k/
/k/ is either an affricate [kx], or a fricative [ç, x], e.g. *speaker*

less salient
(and also found elsewhere)

highly salient
(and largely restricted to Liverpool)

(among others: Trudgill 1999; Watson and Clark 2013; Honeybone and Watson 2013; Watson and Clark 2015; Juskan submitted)

Stimuli

1. 48 carrier sentences (6 pairs per variable) were recorded by a linguist from Manchester
   example:
   - People in that town almost never went to **church**.
   - In that town **church** was not popular with people.

2. using Praat scripts, keywords were extracted automatically from the sentences and four different versions were resynthesised
   (1) hyper-Mancunian/standard version
   (2) actual Mancunian/standard sound as heard in the sentence
   (3) light Scouse version
   (4) very Scouse version

Online test

- administered using SoSciSurvey.de
- participants randomly assigned to a group
  I. primed for Liverpool
  II. primed for Manchester
- new randomised order for every subject
- answer and reaction time automatically recorded and saved
  (observations with RT < -2000ms or > 4000ms were discarded)
- information on subjects' gender, age, regional origin, education, and profession collected

23% completed

Liverpool

2. Which word sounds most like the one you heard in the sentence?
Focus on the underlined sound.

All his life, he had wanted to be a nu<u>r</u>se

| sound 1 | sound 2 | sound 3 | sound 4 |

M.A. Marten Juskan, Albert-Ludwigs-Universität Freiburg im Breisgau – 2014

Participants

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	'Liverpool'		'Manchester'	
	F	M	F	M
wc	2	3	1	1
mc	17	6	9	16

- 58 subjects from outside of Liverpool (2508 observations)
- (results from 9 Liverpudlian subjects are comparable, but not included in this paper)

Mixed linear effects models

- mixed linear effects regression models were fit by hand
- random intercept for subject
- random slope for subject X order of stimuli

significant factors:

- happʏ (κ = 10.61)
    - position; p < 0.001
    - (distance); p = 0.084

- /ŋg/ (κ = 7.88)
    - (prime); p = 0.057
    - (age); p = 0.010
    - environment; p = 0.002

- ɴᴜʀsᴇ (κ = 8.05)
    - prime; p = 0.022
    - position; p < 0.001
    - (stimulus order); p = 0.093

- /k/ (κ = 7.9)
    - prime; p = 0.838
    - class; p = 0.002
    - environment; p < 0.001
    - (distance); p = 0.092
    - (prime X class); p = 0.075

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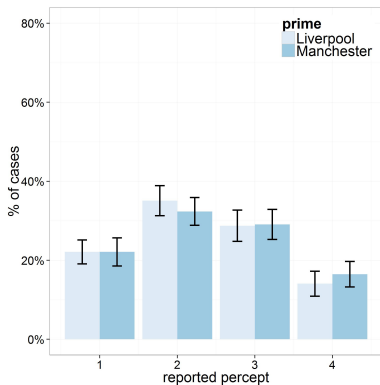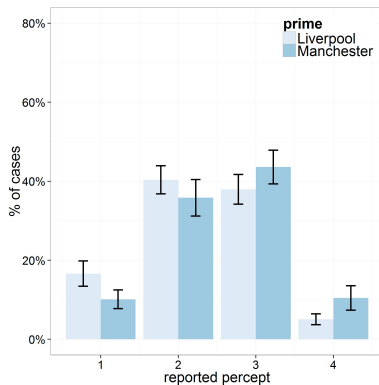bar plots
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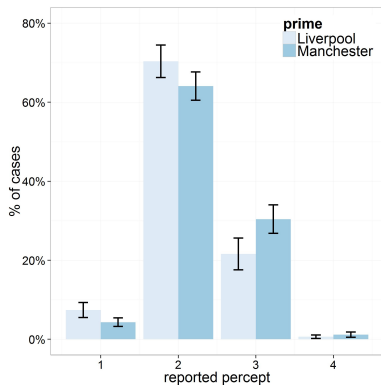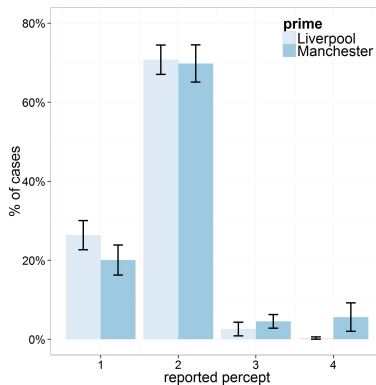assimilation vs. contrast
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References

happʏ and /ŋ(g)/

(a) happʏ

(b) /ŋ(g)/

NURSE and /k/

(a) NURSE

(b) /k/

Summary of results

1. social salience plays a role
   - no priming effect for HAPPY, weak one for velar nasal plus
   - relatively robust priming effects for NURSE and /k/-lenition
   - some (!) evidence for impact of social factors

2. effects are small
   - objectively 'correct' token chosen in 60–70% of cases (salient variables)
   - at least to a degree, this is also true for previous research
   - preference for actual token is slightly less pronounced for the two vowels

3. all priming effects are in the unexpected direction
   - prime 'Liverpool' **decreases** chances of a Scouse percept
   - prime 'Manchester' **increases** chances of a Scouse percept

Direction of effect due to attitude?

Hay and Drager 2010

New Zealand women

- neutral or positive attitudes towards Australia
- Australian exemplars activated
- effect in expected direction

New Zealand men

- negative attitudes towards Australia (< sports rivalry)
- NZ exemplars activated (dissociation)
- effect in opposite direction

- possible explanation for responses of participants living elsewhere (< bad reputation of Liverpool and Scouse), BUT
- Liverpudlian subjects show the same inverted effect!

Relative hostility

Herr 1986

- Subjects are given a neutral description of a fictitious person 'Donald'
- hostility ratings differ depending on the prime
  1. very nonhostile person (Pope John Paul, Santa Claus)
     → Donald rated hostile

  2. somewhat nonhostile person (Henry Kissinger, Robin Hood)
     → Donald rated nonhostile

  3. somewhat hostile person (Menachem Begin, Alice Cooper)
     → Donald rated hostile

  4. very hostile person (Adolf Hitler, Dracula)
     → Donald rated nonhostile

Assimilation and contrast effects

Herr 1986

1. 'moderate' primes create assimilation effects
   - (ambiguous) input is comparatively similar to primed category
   - primed category is used for classification of stimulus
2. 'extreme' primes create contrast effects
   - (ambiguous) input is very different from primed category
   - stimulus is not included in primed category, BUT
   - prime can still serves as perceptual baseline, which shifts stimuli towards the other end of the scale

→ 'Canada' ('Australia') is a moderate prime in the US (NZ)   phonetic similarity
→ 'Liverpool' is an extreme prime in (Northern) England   phonetic divergence

Conclusions: food for thought

The outcome of exemplar priming experiments is likely to depend on:

1. the (social) salience of the variable
2. the (subjective) extremeness of the prime
3. the difficulty of the task (vowel continuum vs. consonant categories)
4. (further candidates: phonological environment, number and presentation of answer tokens, (perceived) social background of stimulus speaker...)

social priming in sociophonetics

- is **interesting from a theoretical point of view** because it tells us a lot about speech perception, processing, and memory structure
- but only shows when a number of requirements are met
- and is therefore a lot **less important in practical terms**

References I

Cesario, Joseph (2014). "Priming, replication, and the hardest science". In: **Perspectives on Psychological Science** 9.1. 40–48.

Gambi, Chiara and Martin J. Pickering (2013). "Prediction and imitation in speech". In: **Frontiers in Psychology** 4. 1–9.

Hay, Jennifer and Katie Drager (2010). "Stuffed toys and speech perception". In: **Linguistics** 48. 865–892.

Hay, Jennifer, Aaron Nolan, and Katie Drager (2006). "From fush to feesh: Exemplar priming in speech perception". In: **The Linguistic Review** 23. 351–379.

Herr, Paul M. (1986). "Consequences of priming: judgment and behavior". In: **Journal of Personality and Social Psychology** 51.6. 1106–1115.

Honeybone, Patrick and Kevin Watson (2013). "Salience and the sociolinguistics of Scouse spelling: exploring the phonology of the Contemporary Humorous Localised Dialect Literature of Liverpool". In: **English World-Wide** 34.3. 305–340.

Jaeger, T. Florian and Neal Snider (2007). "Implicit learning and syntactic persistence: surprisal and cumulativity". In: **University of Rochester Working Papers in the Language Sciences** 3.1. 26–44.

Juskan, Marten (2011). "National stereotypes in speech perception and speaker evaluation". Unpublished Master thesis. University of Freiburg, English Department.

— (submitted). "Production and Perception of Local Variants in Liverpool English — Change, Salience, Exemplar Priming". PhD thesis. University of Freiburg, English Department.

References II

Lawrence, Daniel (2015). "Limited evidence for social priming in the perception of the BATH and STRUT vowels". In: **Proceedings of the 18th International Congress of Phonetic Sciences**. Ed. by The Scottish Consortium for ICPhS 2015. Paper number 244. Glasgow: University of Glasgow. 1–5. URL: http://icphs2015.info/pdfs/Papers/ICPHS0244.pdf (visited on 10/09/2015).

Montgomery, Chris (2007). "Northern English Dialects: A perceptual approach". PhD thesis. University of Sheffield. URL: http://etheses.whiterose.ac.uk/1203/.

Niedzielski, Nancy (1999). "The Effect of Social Information on the Perception of Sociolinguistic Variables". In: **Journal of Language and Social Psychology** 18. 62–85.

Pierrehumbert, Janet (2006). "The next toolkit". In: **Journal of Phonetics** 34. 516–530.

Squires, Lauren (2013). "It don't go both ways: Limited bidirectionality in sociolinguistic perception". In: **Journal of Sociolinguistics** 17.2. 200–237.

Styler, William F. (2008). "Establishing the nature of context in speaker vowel space normalization". Unpublished Master thesis. University of Colorado, Department of Linguistics.

Trudgill, Peter (1999). **The Dialects of England**. Second. Oxford: Blackwell.

Watson, Kevin and Lynn Clark (2013). "How salient is the NURSE SQUARE merger?" In: **English Language and Linguistics** 17.2. 297–323.

— (2015). "Exploring listeners' real-time reactions to regional accents". In: **Language Awareness** 24.1. 38–59.