Variable rules or variable inputs? Process-based and representational approaches to variation

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Some questions

- How do representational & process-based accounts differ, regarding what they can account for and how?

- Are certain aspects of variation better accounted for in one place over another?

- Is one approach better, or should they be combined in some way?

This talk

- A discussion of process-based vs. representational approaches to variation

- Why we need both

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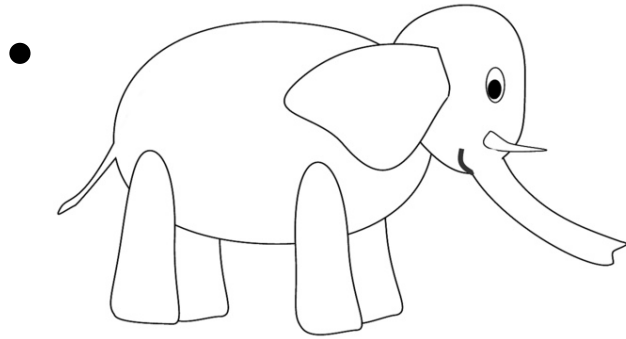
Process-based approaches

- Variable rules (Labov 1969, Cedergren & Sankoff 1974...)

$$ X \longrightarrow \langle Y \rangle \bigg/ \left\langle \begin{matrix} [\text{fea A}] \\ [\text{fea B}] \\ \vdots \end{matrix} \right\rangle \left\langle \begin{matrix} \overline{[\text{fea I}]} \\ [\text{fea J}] \\ \vdots \end{matrix} \right\rangle \left\langle \begin{matrix} [\text{fea P}] \\ [\text{fea Q}] \\ \vdots \end{matrix} \right\rangle [\text{fea Z}] $$

- Factors influence outcome probabilistically, can be either linguistic or social

- Single, invariant UR from which surface variation is derived

Process-based approaches

- Variable ranking of OT constraints (Kiparsky 1993, Anttila 1997, 2002, Boersma & Hayes 2001...)

The violation pattern

		*COM-PLEX	ONSET	ALIGN-L-W	ALIGN-R-P	PARSE
1. /kast əgɛn/	(a) kast][əgɛn	*	*			
	(b) kas]t[əgɛn		*			*
	(c) kas][təgɛn			*		
2. /kast mi/	(a) kast][mi	*				
	(b) kas]t[mi					*
	(c) kas][tmi	*		*		
3. /kast/	(a) kast]]	*				
	(b) kas]]t				*	*

Tableau from Anttila (2007)

Process-based approaches

- Variable ranking of OT constraints (Kiparsky 1993, Anttila 1997, 2002, Boersma & Hayes 2001...)

The factorial typology

	cost again	cost	cost me
(a)	faithful	faithful	faithful
(b)	**deletion**	faithful	**deletion**
(c)	**deletion**	**deletion**	**deletion**
(d)	resyllab	faithful	faithful
(e)	resyllab	faithful	**deletion**
(f)	resyllab	**deletion**	**deletion**

Bonus: quantitative interpretation

Process-based approaches

- Unified theoretical account of categorical & variable processes
  - Same theoretical apparatus, same linguistic constraints
- Productivity
- Privileges the citation form
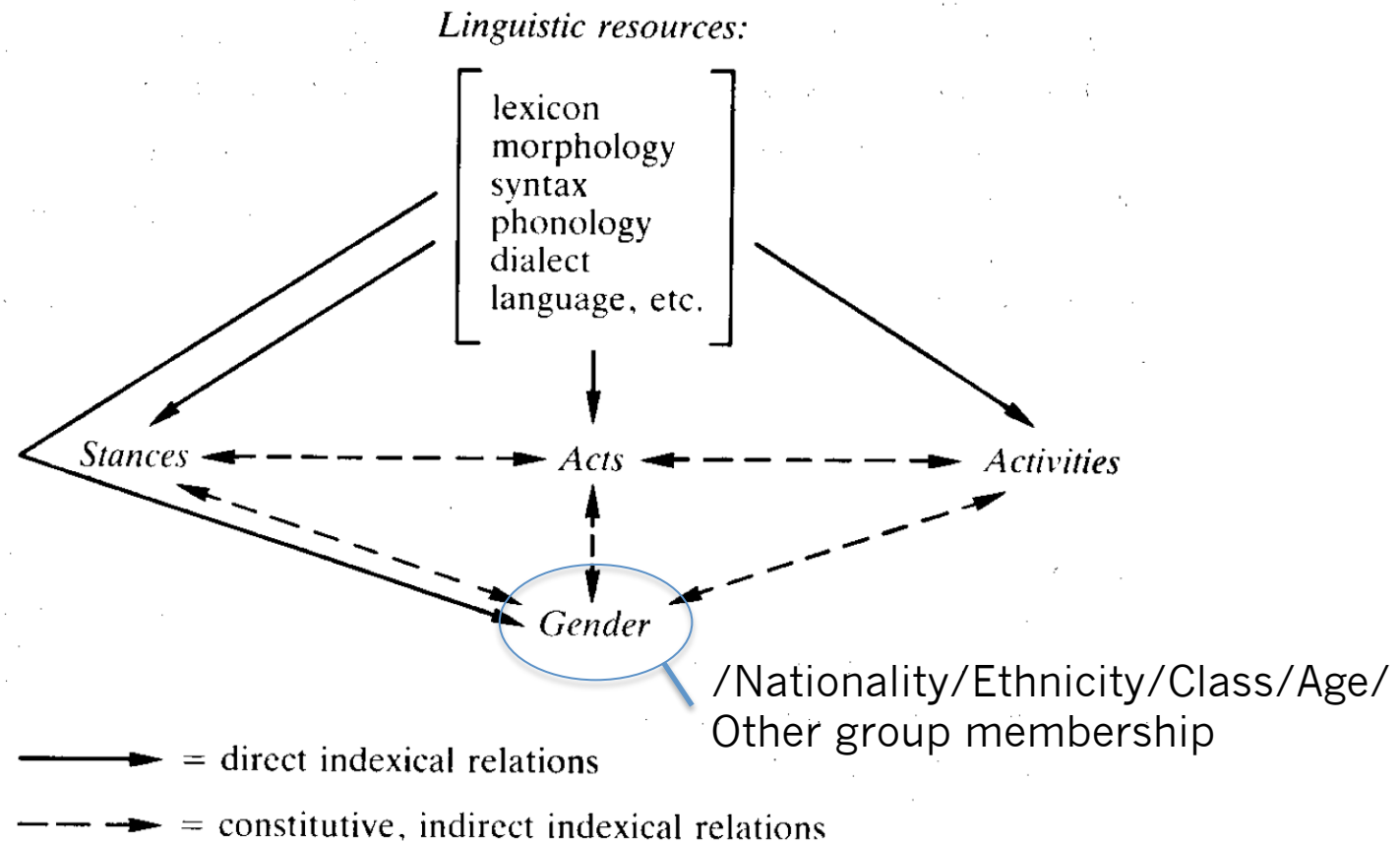- Explicit qualitative & quantitative predictions ✔

Process-based approaches

- Intraspeaker social/stylistic constraints are problematic

- Stylistic variation along a unidimensional formality dimension doable (van Oostendorp 1997), but

- Socioindexicality? (e.g. Silverstein 2003, Eckert 2008, Foulkes 2010)

Ochs (1992)'s indexical model

Process-based approaches

- Intraspeaker social/stylistic constraints are problematic
- Stylistic variation along a unidimensional formality dimension doable (van Oostendorp 1997), but
- Socioindexicality? (e.g. Eckert 2008, Foulkes 2010)
- Gradience
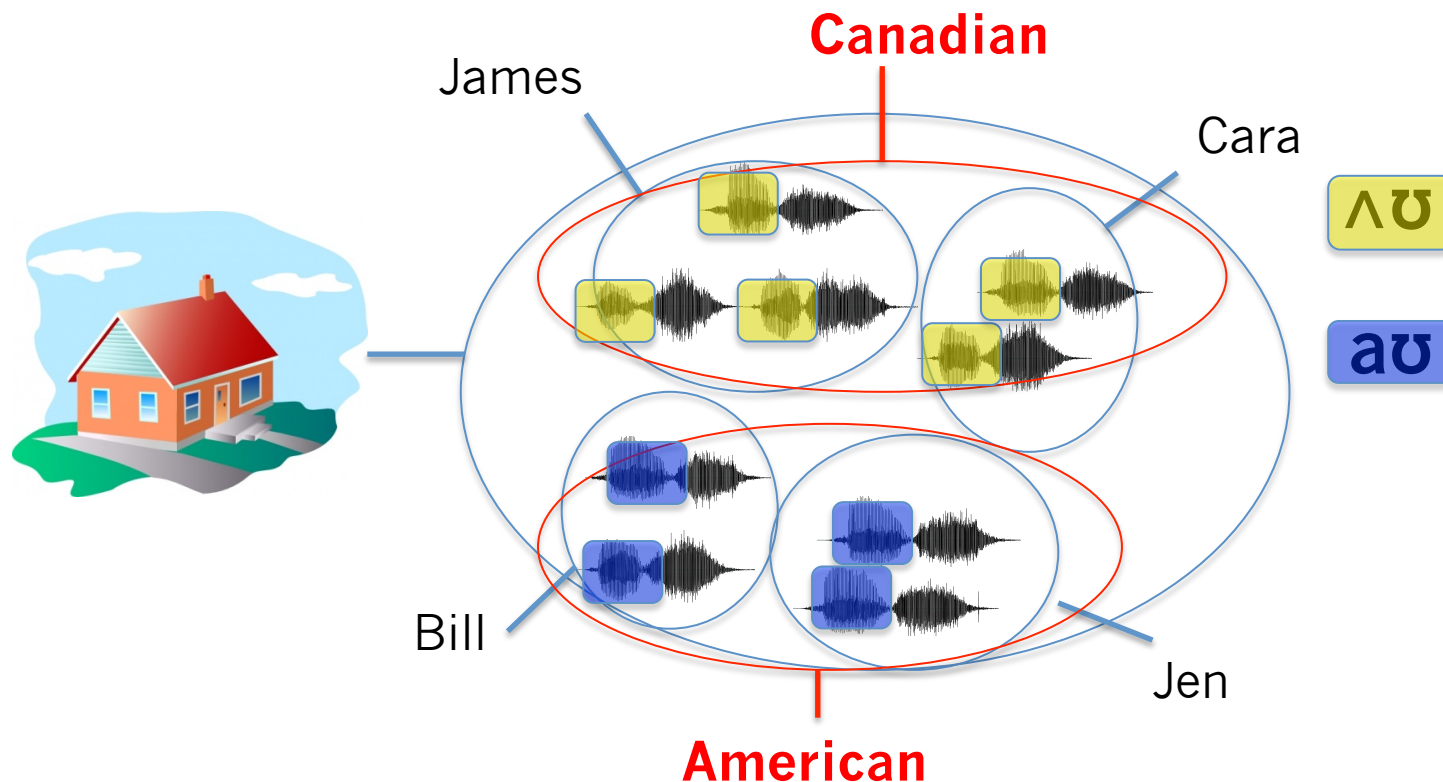- Word-specific phonetics (Pierrehumbert 2001) ✗

Representational approaches

- ## Exemplar theory (e.g. Johnson 1997, 2006; Pierrehumbert 2001 etc, Foulkes & Docherty 2006)
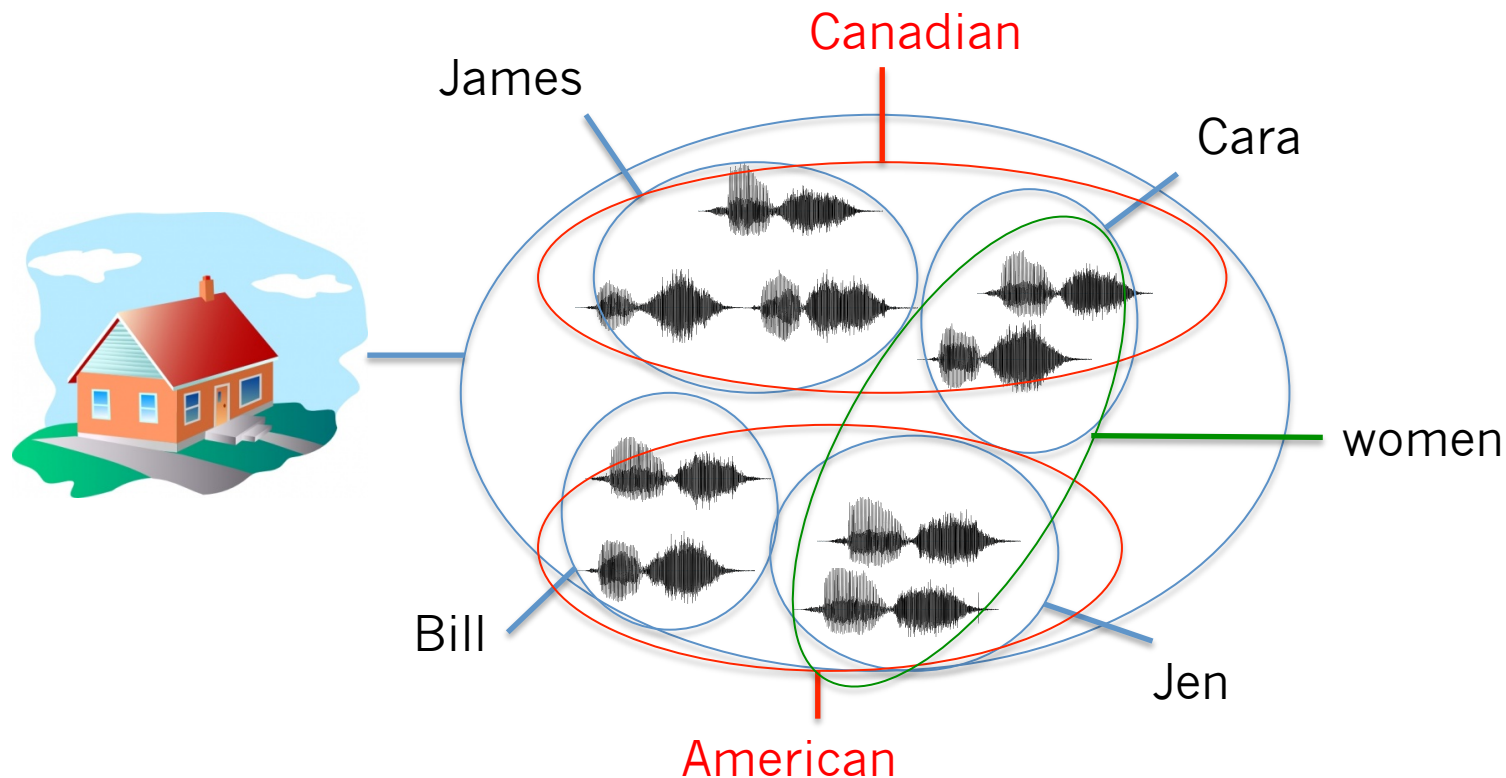
Representational approaches

- "Hybrid models" (Pierrehumbert 2006, Goldinger 2007) add abstract phonological category labels

Representational approaches

- Patterned gradience
- Word-specific phonetics
- Easily handles social context effects on variation

✔

Representational approaches

- No principled distinction made between linguistic factors and social factors
  - Linguistic constraints > social constraints (Preston 1991)
- Citation form just one (set of) exemplars of many
- Accounts for everything, predicts nothing?

✗

Summary

- Process-based approaches are good at modeling the linguistic aspects of variation

- Representational approaches are needed to capture the socioindexical

- ….Two great tastes that taste great together?

Sketch of elephant

- Abstract segmental representation is chosen based on lexical & direct indexical needs
- This representation serves as input to grammar
- Grammar output is spelled out in reference to stored exemplars ("phonetics" & indirect indexicality)

Choose a representation

Choose a representation

ʃ

1

2

3

ʌʊ

aʊ

t

"shout"

Canadian
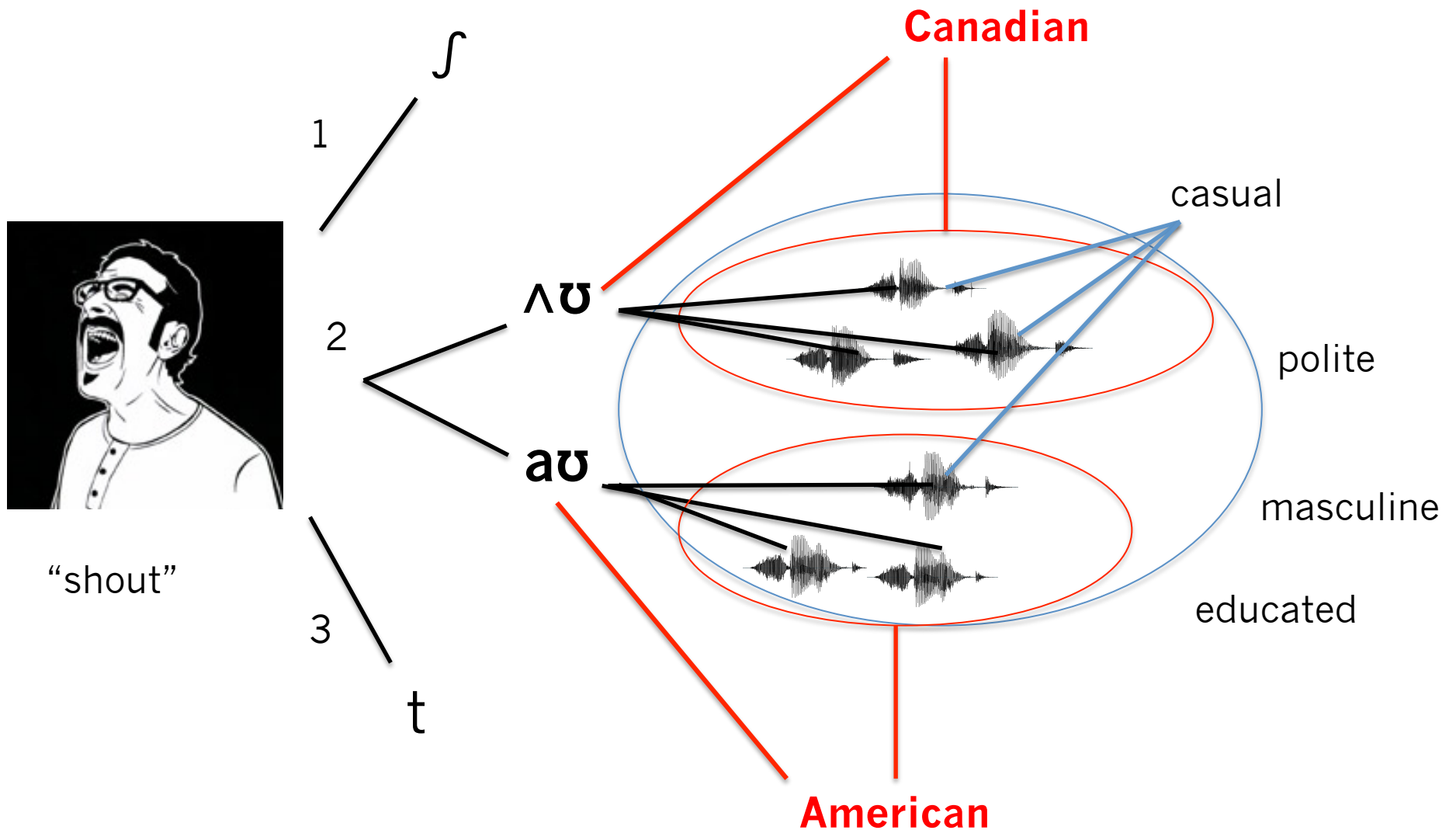
American
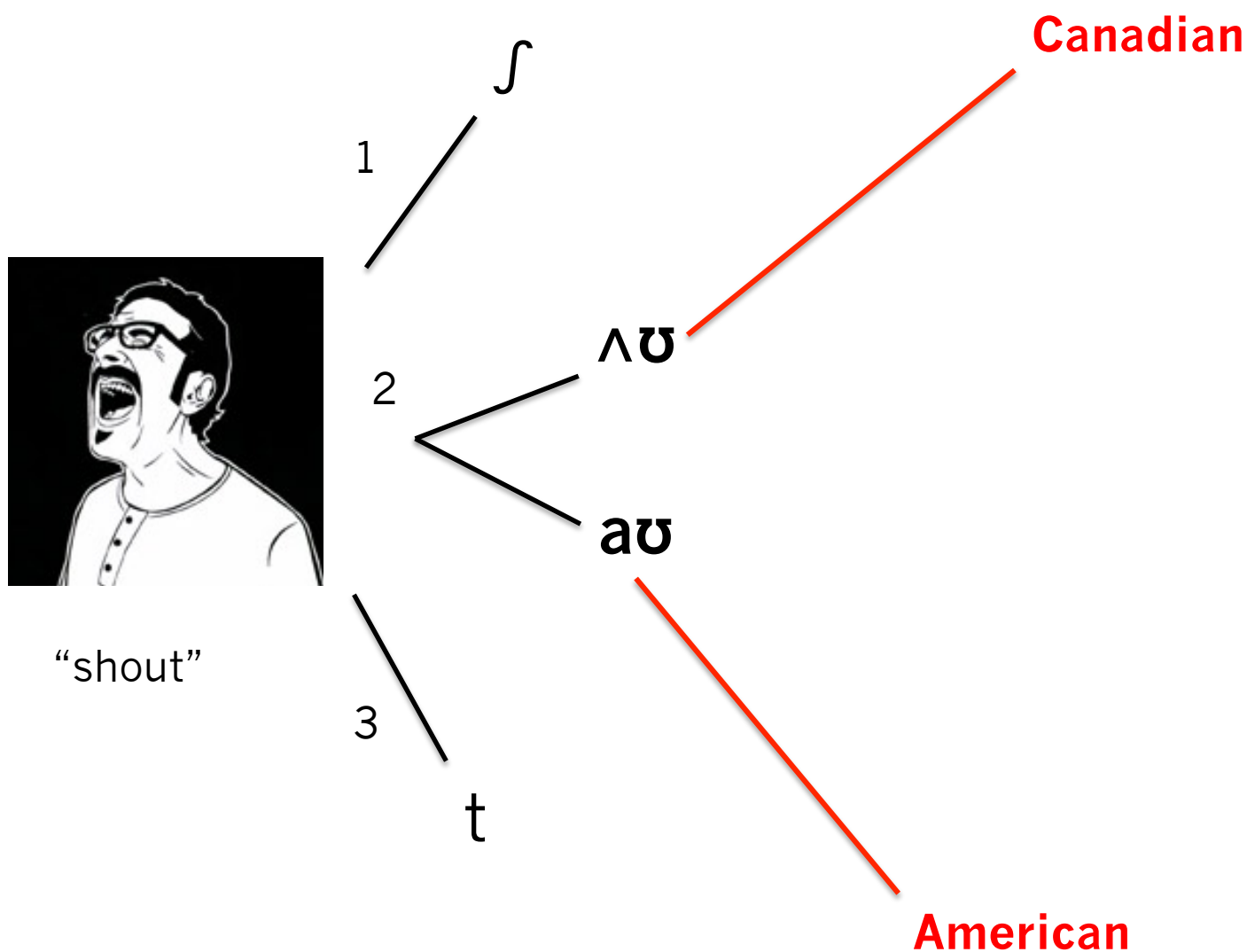
Pass it to the grammar

/ʃʌʊt/ + /ɪŋ/

↓

Grammar*
(categorical and
variable processes)

↓

[ʃʌʊɾɪŋ]

*being very
agnostic here

Choose form for realization

Another case: final t/d

k

1

ɔ
2

"cost"

s
3

t
4

casual

masculine

educated

Another case: final t/d

/kɔst/

Grammar
(categorical and
variable processes)

[kɔst], [kɔs]

Another case: final t/d

k

1

ɔ

2

"cost"

s

3

4

t

casual

masculine
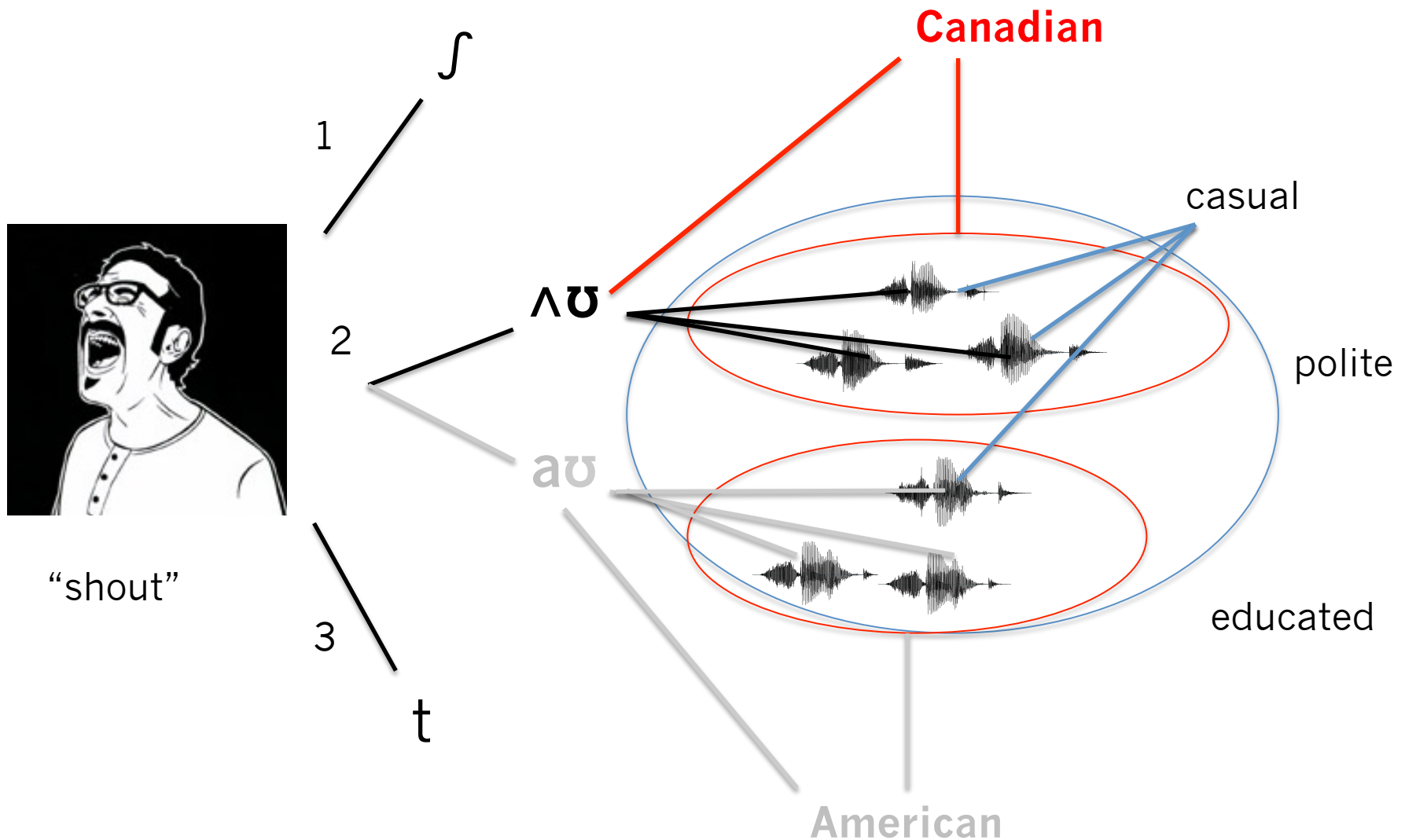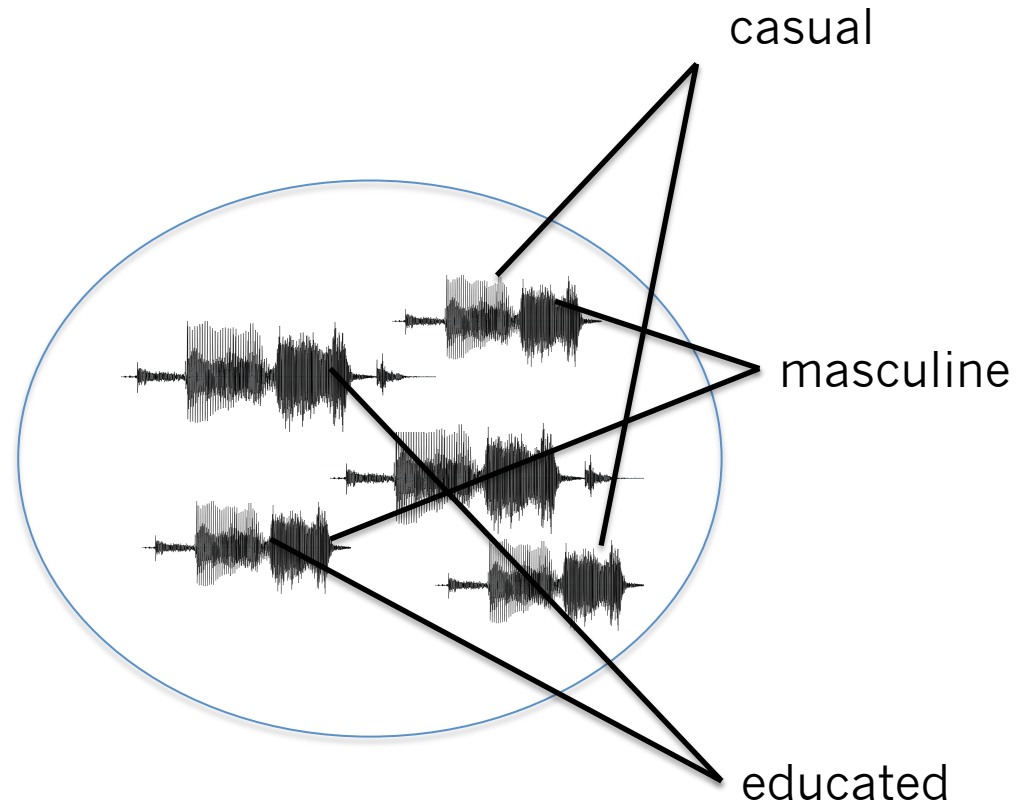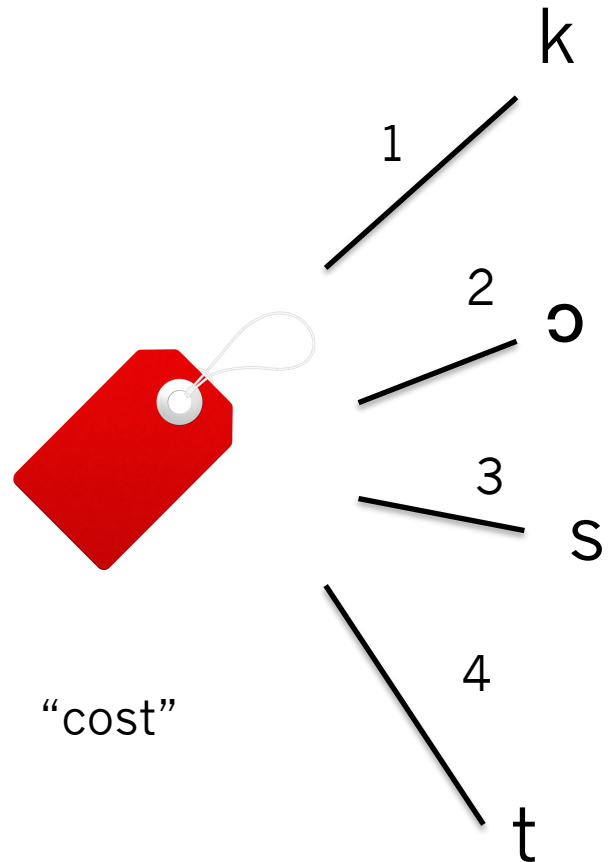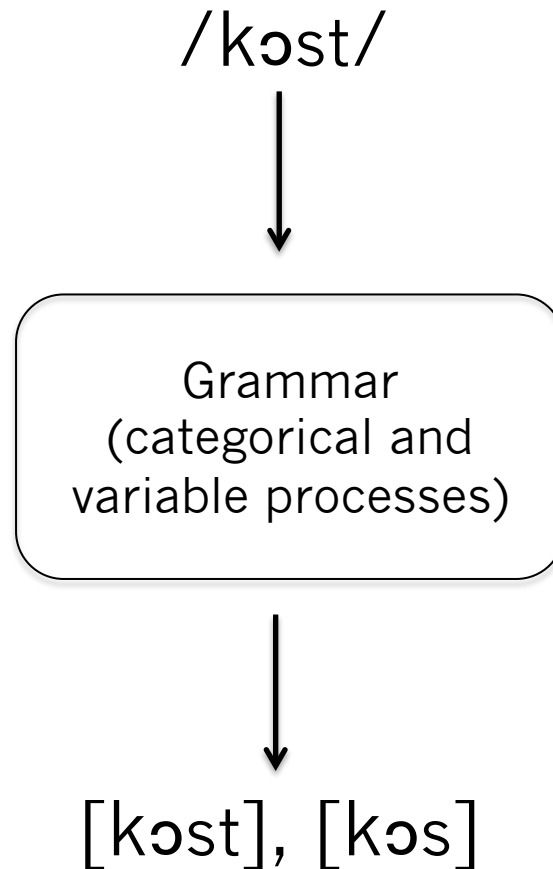
educated
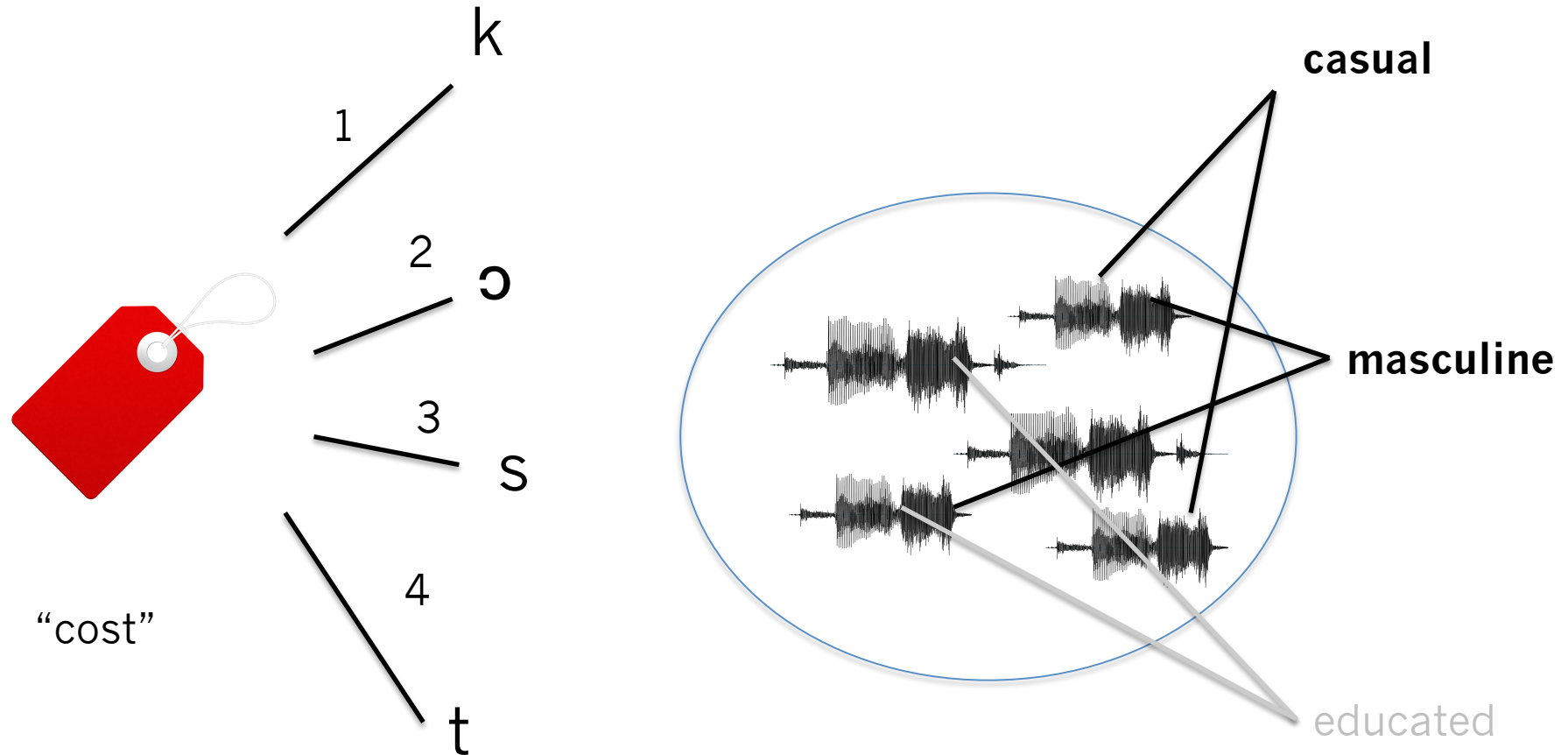
Summary & Implications

- 3 potential loci of variation:
  - Representations 1: Choice of directly indexical variant
  - Grammar: variable evaluations
  - Representations 2: Choice of realization based on other contextual effects
- Direct links between abstract linguistic form and social meaning reflect direct indexical relations

Summary & Implications

- Distinction between features which directly index social categories vs. those that indirectly index via stances, etc. →

- Socioindexical constraints active at different stages vis-à-vis the grammar

Summary & Implications

- Choice of variants before grammar can give rise to apparent opacity effects, should not show frequency/word specific effects
- Gradience, frequency/word-specific effects happen at Stage 3; no frequency effects on selection of variant at Stage 1

For future research

- Typology of sociolinguistic variables: 2 kinds?

- Bring quantitative data to bear on the proposed interactions between representation and grammar
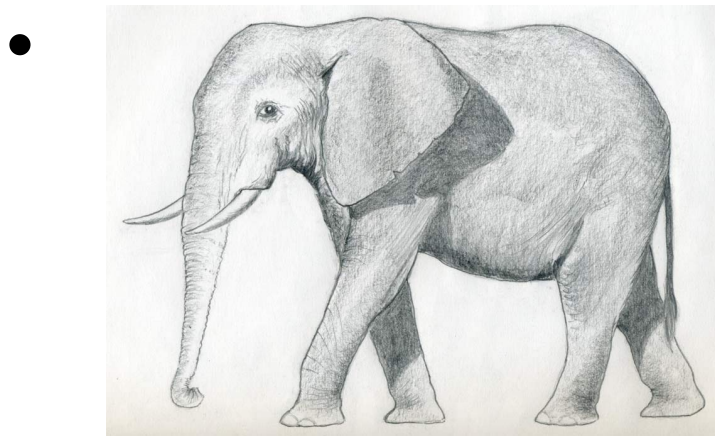
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Thank you!

References

Anttila, Arto. 1997. Deriving variation from grammar. In Hinskens et al., (eds.), Variation, Change and Phonological Theory. John Benjamins: 35–68.

Anttila, Arto. 2002. Variation and phonological theory. In Chambers & Schilling-Estes (eds.), The Handbook of Language Variation and Change. Blackwell.

Antilla, Arto. 2007. Variation and optionality. In Paul de Lacy (ed.) The Cambridge Handbook of Phonology. Cambridge: 519-536.

Boersma, Paul & Bruce Hayes. 2001. Empirical tests of the gradual learning algorithm. Linguistic Inquiry 32:45–86.

Cedergren, Henrietta J. & David Sankoff. 1974. Variable rules: Performance as a statistical reflection of competence. Language 50:333–355.

Chomsky, Noam & Morris Halle. 1968. The sound pattern of English. Harper and Row.

Eckert, Penelope. 2008. Variation and the indexical field. Journal of Sociolinguistics 12:453-476.

Eckert, Penelope. 2012. Three waves of variation study: The emergence of meaning in the study of sociolinguistic variation. Annual Review of Anthropology 41: 87-100.

Foulkes, Paul. 2010. Exploring socio-indexical knowledge: A long past but a short history. Laboratory Phonology 1: 5-39.

Foulkes, Paul & Gerard Docherty. 2006. The social life of phonetics and phonology. Journal of Phonetics 34:409–438.

References

Goldinger, Stephen. 2007. A complementary systems approach to abstract and episodic speech perception. Proceedings of ICPhS.

Johnson, Keith. 1997. Speech perception without speaker normalization: an exemplar model. In K. Johnson, & J. W. Mullennix (Eds.), Talker variability in speech processing. Academic Press.: 145-166.

Johnson, Keith. 2006. Resonance in an exemplar-based lexicon: The emergence of social identity and phonology. Journal of Phonetics 34: 485-499.

Kiparsky, Paul. 1993. An OT perspective on phonological variation. Handout,

Labov, William. 1969. Contraction, deletion, and inherent variability of the English copula. Language 45:715–762.

Ochs, Elinor. 1992. Indexing Gender. In Allessandro Duranti & Charles Goodwin (eds), Rethinking context: Language as an interactive phenomenon. 335-358.

Pierrehumbert, Janet, 2001. Exemplar dynamics: word frequency, lenition, and contrast. In: Bybee, Joan, Paul Hopper, (Eds.), Frequency Effects and the Emergence of Linguistic Structure. John Benjamins:137-157.

Pierrehumbert, Janet. 2002. Word-specific phonetics. Laboratory Phonology VII, 101-139.

Pierrehumbert, Janet. 2006. The next toolkit. Journal of Phonetics 34, 516—530.

Preston, Dennis. 1991. Sorting out the variables in sociolinguistic theory. American Speech 66(1): 33-56.

References

Silverstein, Michael. 2003. Indexical order and the dialectics of sociolinguistic life. Language and communication 23: 193-229.

van Oostendorp, Marc. 1997. Style levels in conflict resolution. In Hinskens et al., (eds.), Variation, Change and Phonological Theory. John Benjamins: 207-229.