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Yod variation in Victoria, B.C.: An acoustic-centred approach

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Yod in Victoria

1. The data
2. *Yod:* history, current status
3. Analysis: methodology and results
4. Going forward…

Victoria English Project

- Synchronic Corpus of Victoria English (**SCVE**)
- 162 speakers; 114 in Vic. Vowels Project
- Birth years: 1913–1996 (84 years)
- *Victoria's Vowels Project*: collaboration with Drs. Alex D'Arcy & Becky Roeder
  - 2015 presentations: ADS Portland, NWAV Toronto

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Victoria's Vowels

- Features investigated:

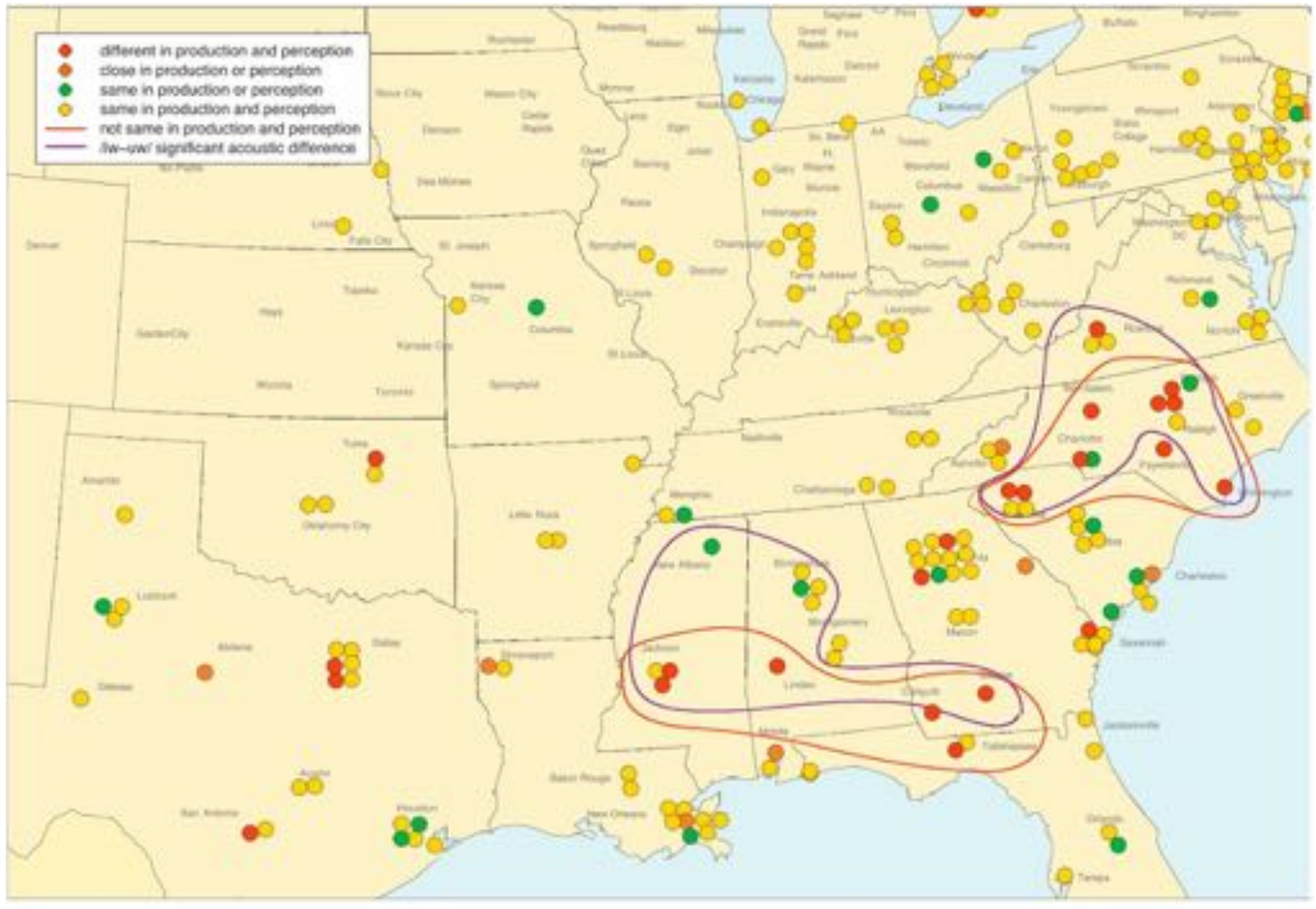
1. *Canadian Shift*:
   recent and aggressive
2. *GOOSE/GOAT fronting*:
   correlated for women only
3. *GOOSE~TRAP*:
   F2 proximity indicates innovative dialect (Boberg 2008)
4. *START retraction*:
   distinct from mainland B.C.
5. *BAG/BAN raising*:
   both raised, Western feature

Yod forms: history and variation

- Two historical sources for **GOOSE** set (Wells 1982):
  - 15th century: Great Vowel Shift [oː] → [uː], e.g. *moon;*
  - 17th century: merger of multiple vowels to [ɪu, ju]
- Two processes of deletion of *yod* (Glain 2012):
  - **Early Yod Dropping**: after palatals, *r*, and *l*-clusters, e.g. *chew, rude, blue*
    - homophonous pairs: *threw–through, brewed–brood*
    - largely complete in most dialects worldwide
  - **Later Yod Dropping**: post-coronal, e.g. *tune, new, student*
    - Cf. non-coronal onsets: e.g. *cute, few, pew*, etc.
    - mainly N. American dialects, variable application

Yod variation in N. America

- *Atlas of N. American English*: widespread fronting and unrounding of /uw/ has led to loss of distinction between *yod* vs. non-*yod* forms
  - e.g. *do* vs. *due*
- Retained in two nonadjacent regions of southeast U.S.
  - perceptually distinct: *orange*
  - acoustically distinct: *purple*
- What about Canada?



Labov, Ash & Boberg (2006), p.55

Yod variation in Canada

- Summaries: Clarke 2006, Boberg 2010
- **Speaker preference**: Orkin 1970, Pringle 1985, Woods 1999
  - preference for *yod*, deletion perceived as 'American'
- **Self-reporting**: Scargill 1974, Chambers 1998; **researcher perception**: Gregg 2004, Clarke 2006
  - higher rates vs. U.S.
- Overall: '*divided and unsettled*', but moving towards lower rates of usage (Boberg 2010)
- **Acoustic analysis**: … ?

Studying yod variation

- Research questions:

1. How can *yod* be identified acoustically?
2. What is the status of *yod* production/retention in Victoria, in terms of individual lexical items as well as social factors?

Acoustic study

1. Perceptual analysis of subset of SCVE
2. Acoustic analysis of perceptually-identified *yod* tokens, establishment of acoustic criteria for *yod* identification
3. Application of acoustic criteria to full SCVE corpus
4. Statistical analysis of *yod* occurrence

Perceptual analysis

- Speakers: 15 out of 114
  - 20–96 years old
  - 8 female, 7 male
- Wordlist items with /uw/: *boots, cool, do,* ***due****, food, fool,* ***new****, soon,* ***student****, too, tool, tooth,* ***tube***
  - 192 tokens, 156 unanimously identified (81%)
  - 3 speakers: zero tokens with *yod*

Perceptual analysis

Speaker	Word(s)	Speaker	Word(s)	Speaker	Word(s)
DI20f	new *soon* tube	CL41m	due new student tube	CD78m	*do* due
PA22m	*soon*	DR57m	due new tube	EM78f	due tube
BB39f	new	HR57m	due new tube	GK80m	due new tube
HG40m	new	JB58f	new student	DJ96f	due new student

Acoustic analysis

- What acoustic qualities to measure?
  - spectral formants (**F1-F3**), acoustic **intensity**, **duration**
  - **discrete** time-points vs. **averages**
- Characteristics measured (Praat scripts: Kawahara 2010, Xu 2015):
  - post-onset **duration** (including glide + nuclear vowel)
  - **F1, F2, F3 & intensity** values at **20 discrete time-point** intervals
  - **mean, minimum, maximum** values for **F1, F2, F3 & intensity**
  - **intensity** change over time (increase/decrease)

Significant 'global' acoustic factors

Factor	Effect Size (F)	Significance (p)
Duration	29.9	1.42e-07 ***
Minimum Intensity	5.786	0.0171 *
Mean F2	27.51	4.15e-07 ***
Minimum F2	4.182	0.0422 *
Maximum F2	41.07	1.13e-09 ***
Maximum F3	4.089	0.0446 *

* $p < 0.05$, *** $p < 0.001$

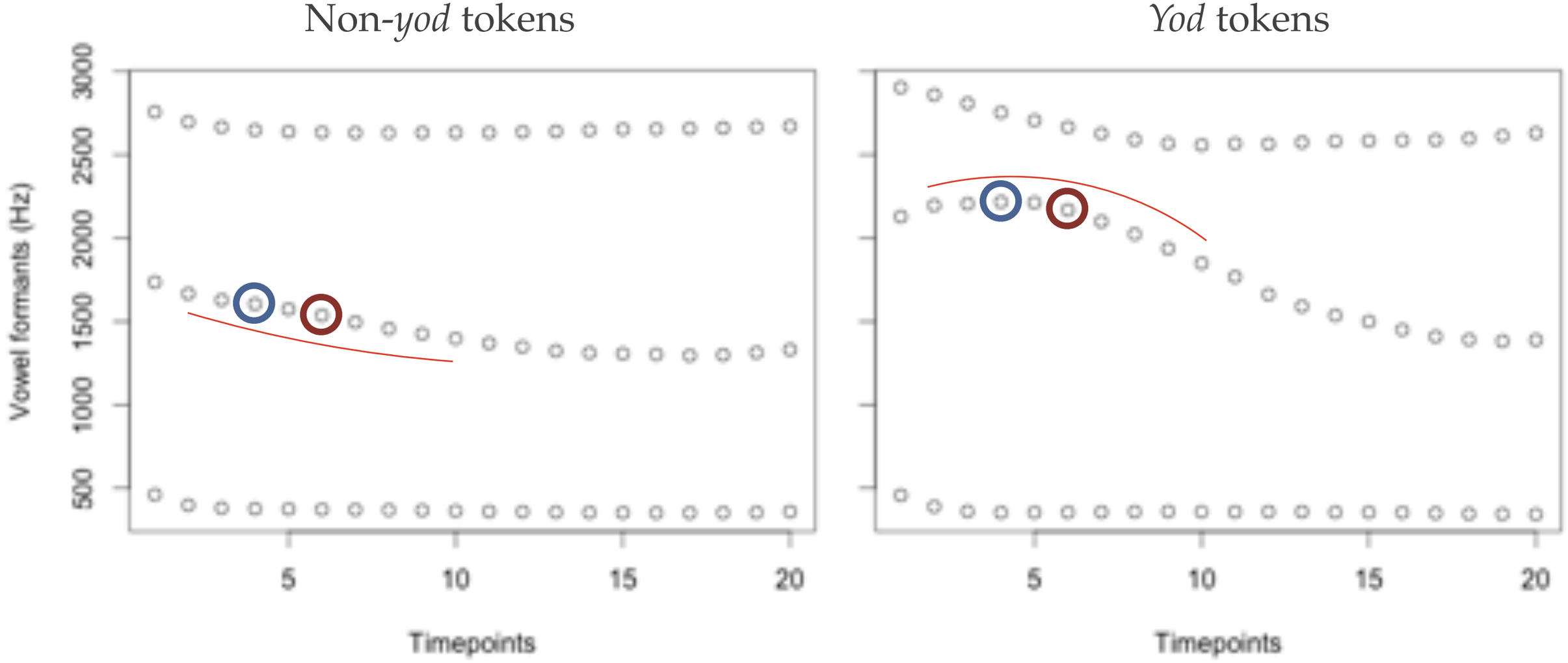
Discrete formants

Timepoints	t1	t2	t3	t4	t5	t6	t7	t8	t9	t10	t11	t12	t13	t14	t15	t16	t17 +
F1	–	–	4	6	5	–	–	–	–	–	–	–	–	–	–	–	–
F2	22	38	44	48	53	55	52	48	40	33	27	18	14	10	8	4	–
F3	7	9	7	4	–	–	–	–	–	–	–	–	–	–	–	–	–

cf.: **Mean F2**, F=27.5; **Max. F2**, F=41

$p < 0.001$, $p < 0.01$, $p < 0.05$

Formant trajectories



Sex-differentiated criteria

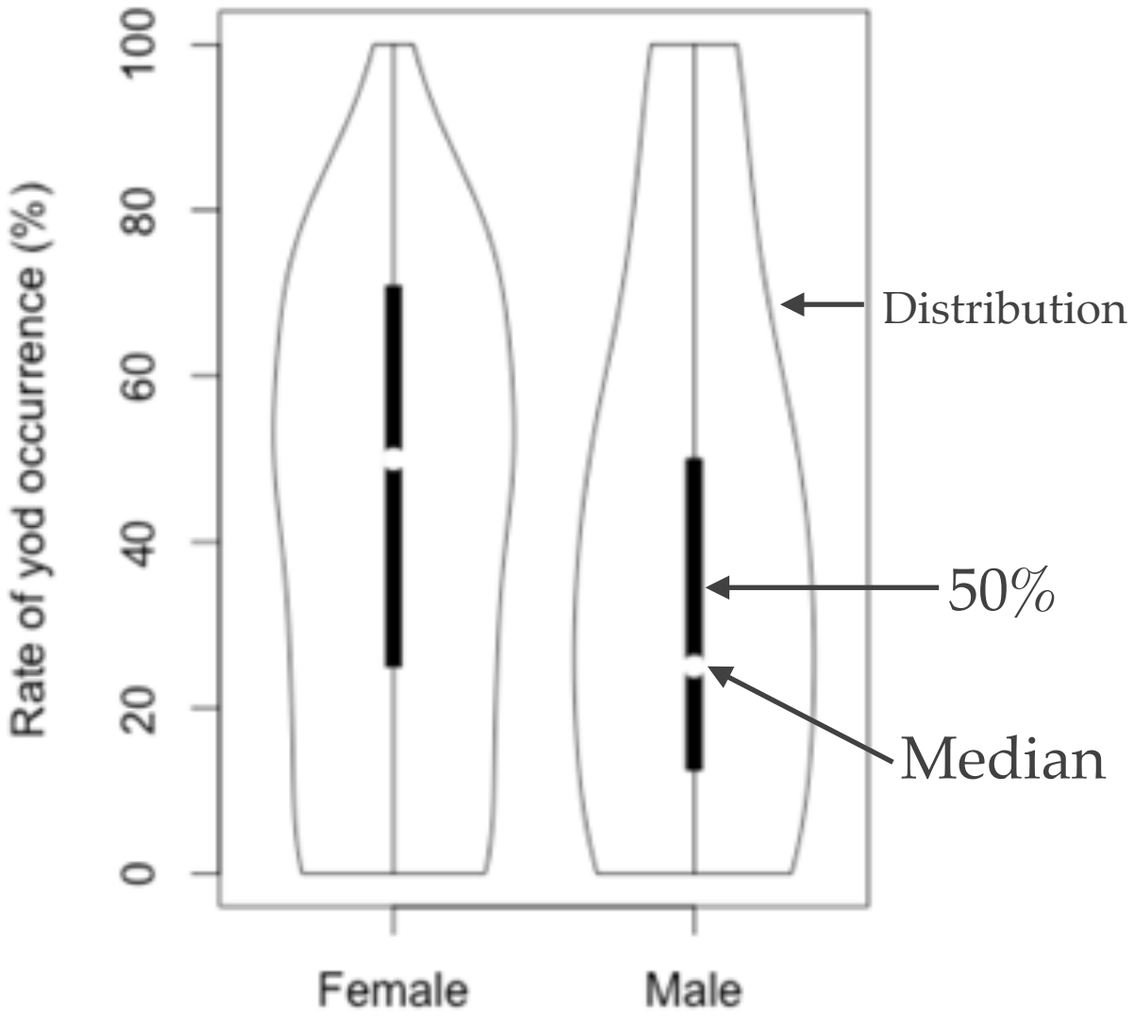
- ANOVA: Speaker sex ~ F2 at 20%, F=15.68, p=0.000106***

F2 at 20% of vowel duration		Female	Male	
Yod	Upper quartile	2580 Hz	2103 Hz	75%
	Mean	2373 Hz	2058 Hz	
	Lower quartile	**2258 Hz**	**1930 Hz**	
Non-*yod*	Upper quartile	2080 Hz	1746 Hz	75%
	Mean	1715 Hz	1444 Hz	
	Lower quartile	1241 Hz	1125 Hz	

Yod retention, loss

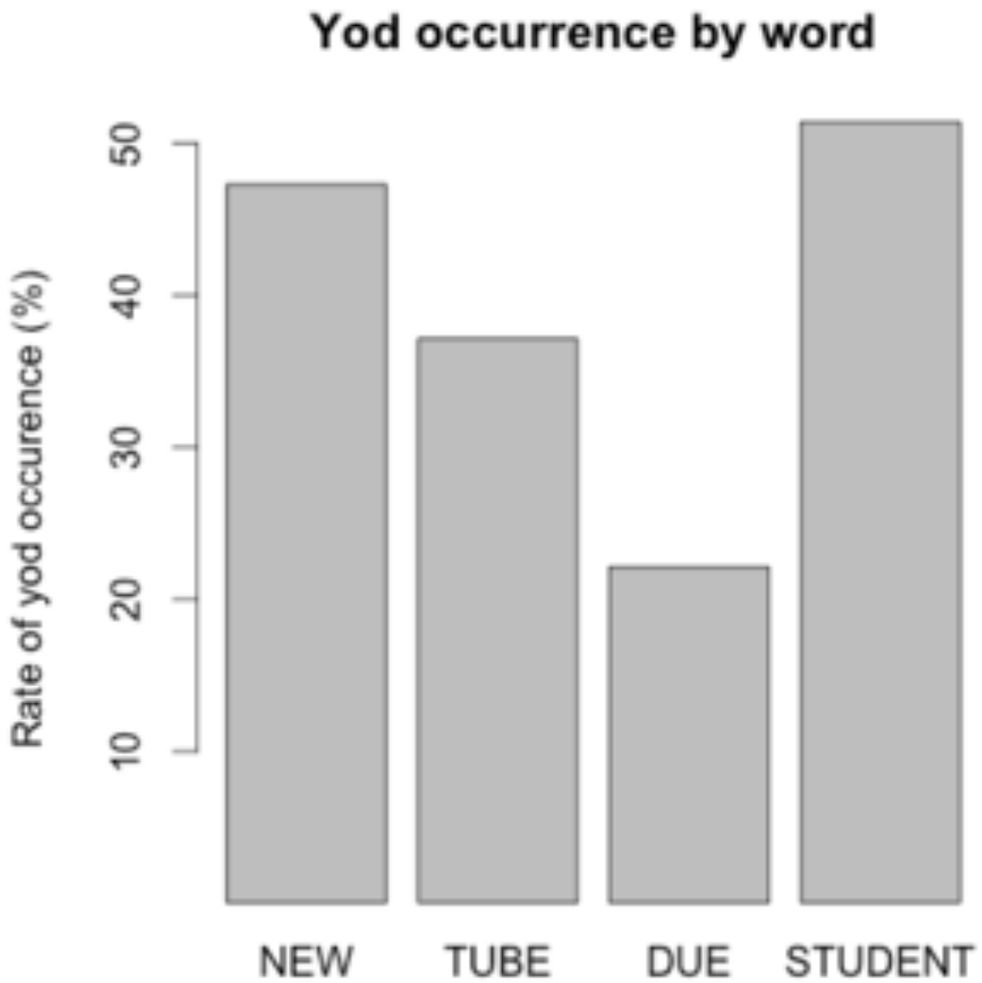
- Criteria: F2 at 20% > 1930 Hz (male), 2258 Hz (female)
- LYD-subject words: ***due, new, student, tube***
- N=443
- Retention of *yod*: N=174, **39.3**%
- Dropping of *yod*: N=269, **60.7**%

Variation by sex



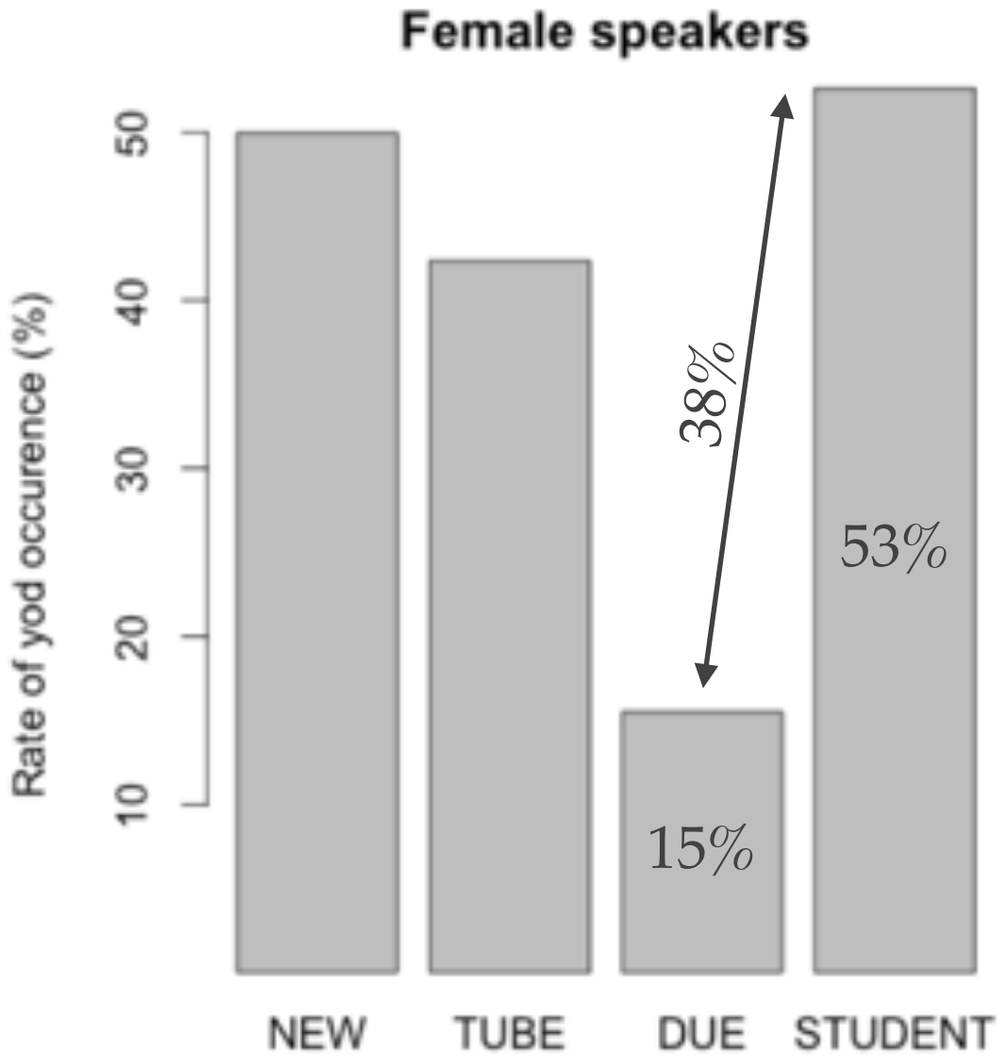
Sex		Rate of *yod* occurrence
Female	Mean	39.69%
	Median	**50%**
Male	Mean	39.24%
	Median	**25%**

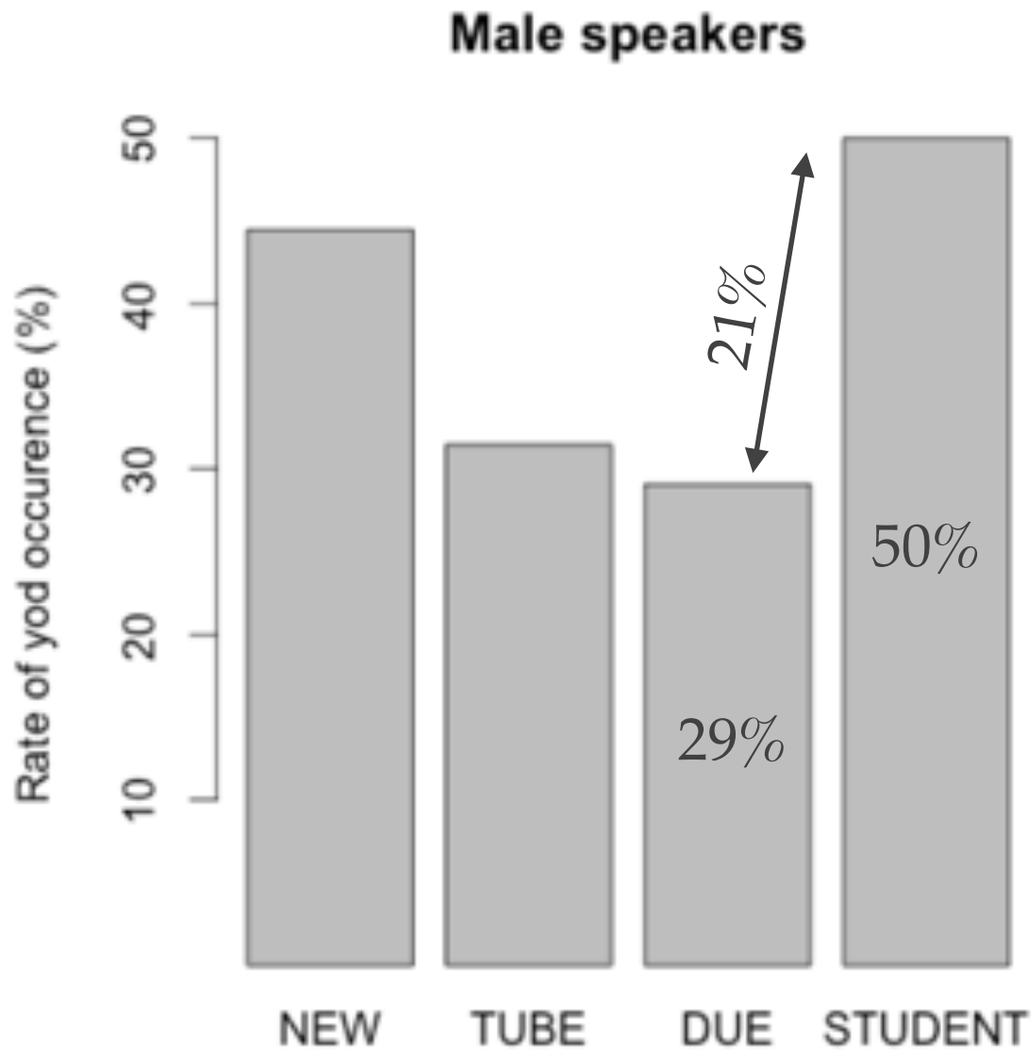
Lexicalized variation



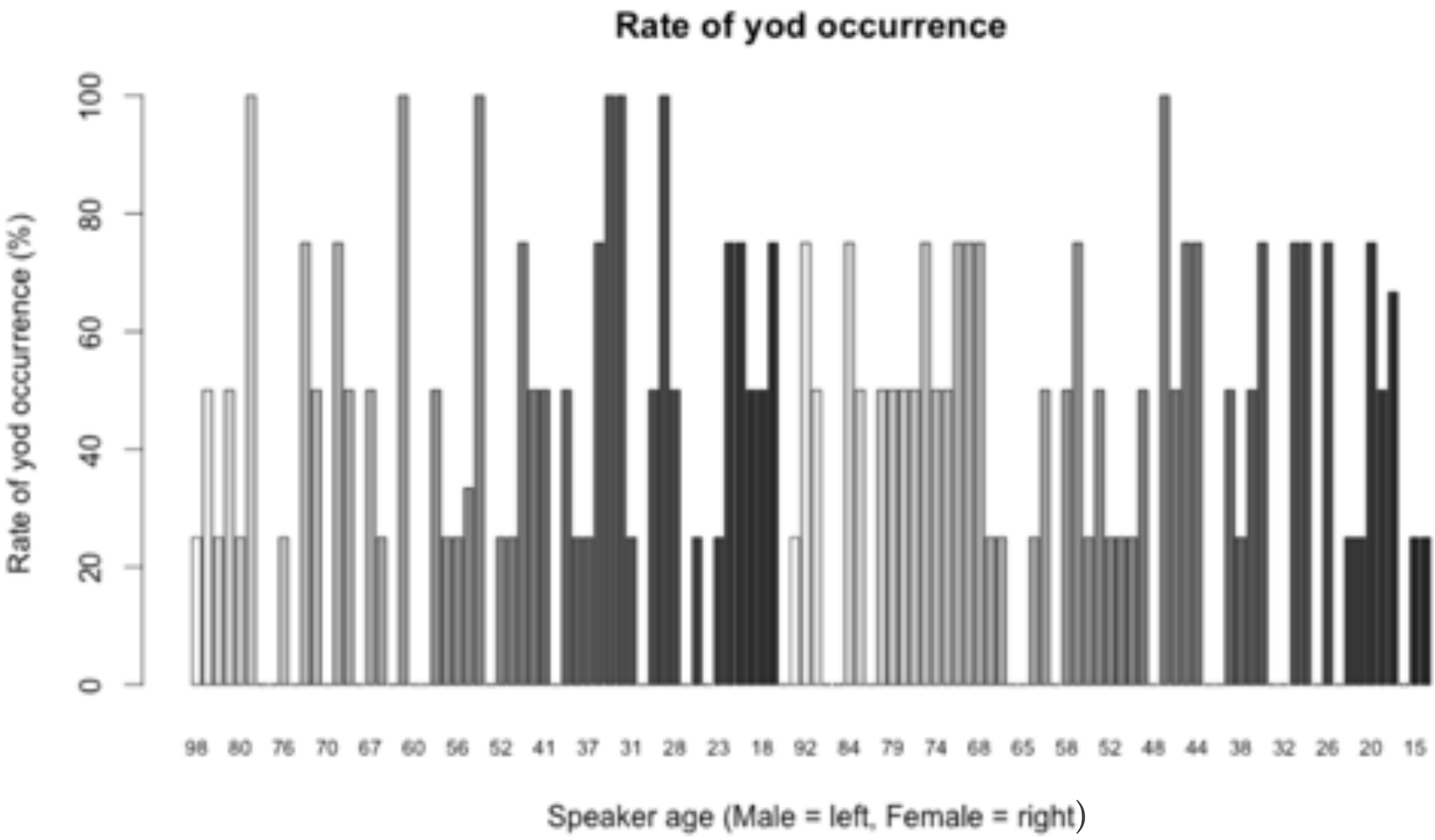
Word	Tokens	*Yod*	Rate
new	112	53	47.3%
tube	113	42	37.2%
due	113	25	22.1%
student	105	54	51.4%

Lexicalized variation by sex



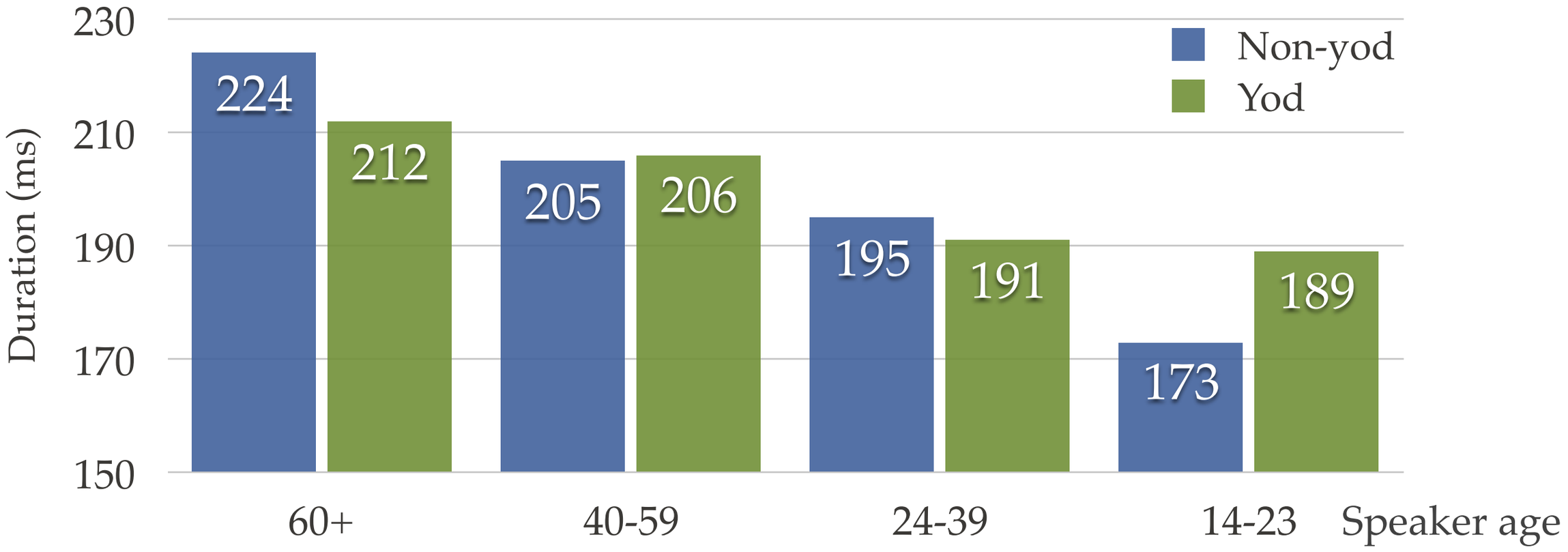


Variation by age and sex



Duration, age, and yod variation

Correlation	Effect size	*p*
Duration~Sex	0.159	0.691
Duration~Age	**4.366**	**<2e-16*****
Duration~Age, non-*yod* tokens	**4.054**	**<2e-16*****
Duration~Age, *yod* tokens	1.191	0.199



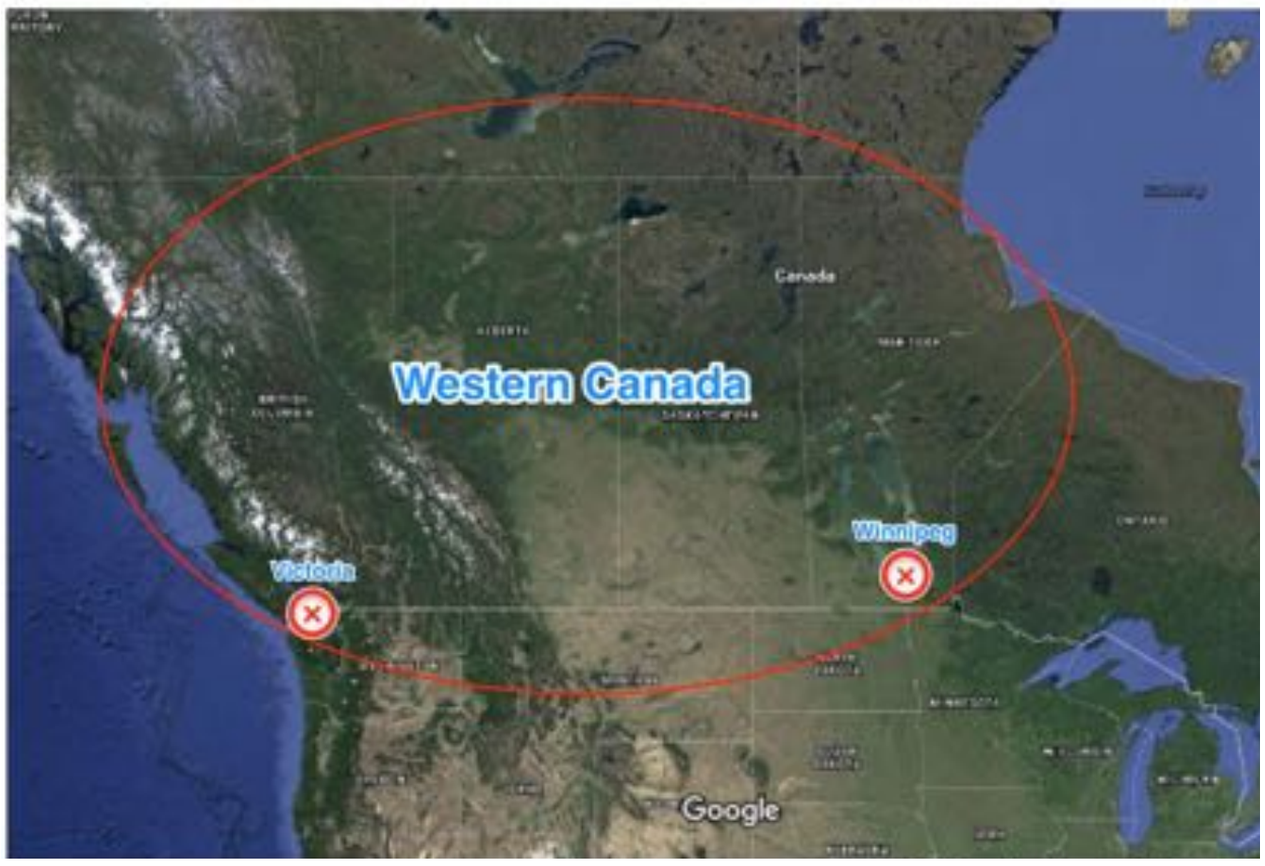
Summary

- **Acoustic analysis**
  - Significant factors: F2 ~20-30%, duration
  - Sex-differentiated criteria for formant measurement
- ***Yod* variation**
  - Relatively high rate of occurrence
  - Distinct by lexical item and sex, non-age-graded
- **Duration**
  - Positive correlation with age only for non-*yod* variants

Future research

- **Experimental study**:
  1. Is *yod* variation perceptible to Victorians?
  2. What is the social function of such variation?

- **Canadian Raising**:
  - *Victoria ~ Winnipeg*



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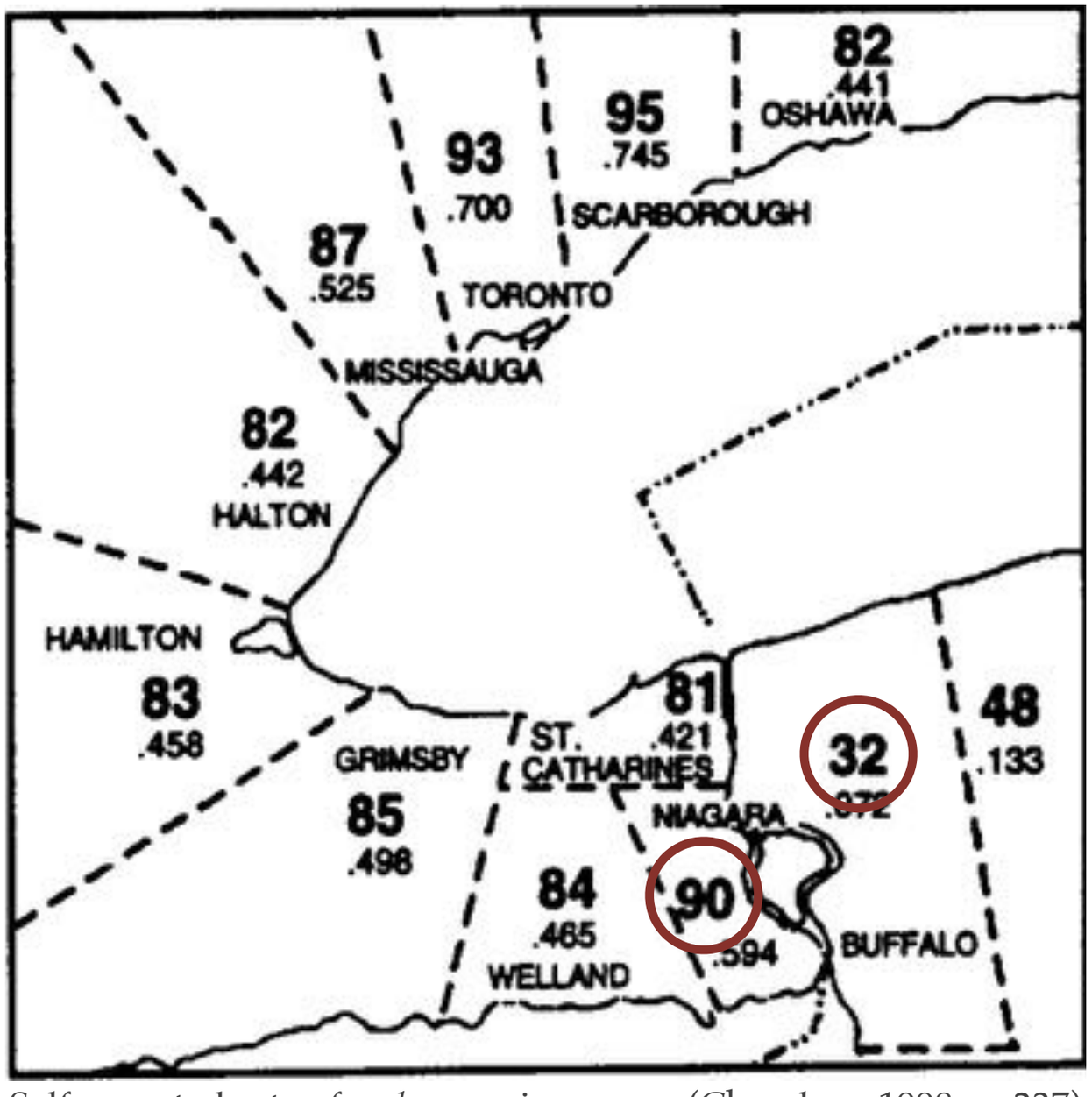
Thank you…

British Columbia Parliament Buildings, Victoria

Yod variation in S. Ontario

- Chambers (1998): self-reported rates of usage (postal survey) in 'Golden Horseshoe' and Buffalo, N.Y.
- Four 'yod' words examined: *avenue, coupon, news, student*
- *W*ords differ on sociolinguistic factors, e.g. only *avenue* is nationally-oriented, and lacks age-grading



Self-reported rate of *yod* usage in *avenue*: (Chambers 1998, p. 237)