

Synchronic Models of Language Change *vs* Diachronic Data: Insights from a New Real-Time Corpus of Glaswegian Vernacular English

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PAC 2014
L'UNIVERSITÉ DE MONTPELLIER III
20140526

0. Background

- No surprise to anyone here, of course, that...
 - Languages change
 - Language changes
 - Linguistic change affects...
 - the lexicon
 - the phonetics & phonology
 - the morphology & syntax
 - the semantics & pragmatics
 - (*etc*)
- Studying language change ...among other things... is what we do in
 - Historical linguistics:
 - How did the language change between past and present?
 - Sociolinguistics:
 - How is the language changing now?
 - How might the language change in(to) the future?
 - Language change *in progress*

1. Research on language change *in progress*

- The ability to study language change ---and particularly sound change-- in progress is “perhaps the most striking single accomplishment of contemporary linguistics” (Chambers 1995:147).

- Largely possible because of the “APPARENT-TIME CONSTRUCT”

- Effectively, a generational analysis

- Speaker *age* as a substitute for chronological *time*

- A variationist tradition, from the very beginning

- Pioneered by Gauchat’s (1905) study of Charmey, Switz.

- First popularized by Labov’s studies of

- Martha’s Vineyard, USA (1963)

- New York City, USA (1966)

- Fundamental assumption

- People speak consistently throughout (at least) adulthood

- Advantages ; Disadvantages

- The alternative: Real-time research

- No substitute for chronological time: *time* as time

- Advantages ; Disadvantages

1. Research on language change in progress

- An absolute, indispensable need for real-time corroboration
 - Variationist sociolinguistics is still a relatively young discipline
 - Until recently, then, real-time studies were vanishingly rare
 - Insufficient real-time examinations of apparent-time data:

e.g., Boberg (2004)

Bowie (2005)

Cameron (2000)

Chambers & Trudgill (1980)

Dannenbergh (2000)

Eckert (1997)

Gordon & MacLagan (2001)

Labov, Ash, & Boberg (2006)

Nevalainen, Raumolin-Brunberg, & Mannila (2011)

Nguyen (2006)

Pope, Meyerhoff, & Ladd (2007)

Raumolin-Brunberg (1996)

Sankoff & Blondeau (2007)

1. Research on language change in progress

- Types of real-time studies (usually also exploiting apparent time)
 - *Longitudinal* (a.k.a. *panel*) studies: SAME speakers
 - {Stability / Change} in individual speakers
 - Montréal: e.g., Yaeger-Dror '89, '94; Wagner & Sankoff 2011
 - Denmark: e.g., Gregersen 2009; Maegaard et al 2013
 - AAE: e.g., Cukor-Avila 2002; Van Hofwegen & Wolfram 2010; Rickford & Price 2013
 - *Cross-sectional* (a.k.a. *trend*) studies: DIFFERENT (similar) spkrs
 - {Stability / Change} in speech communities
 - New Zealand: e.g., Gordon et al 2004; Hay 2012
 - Newcastle/Tyneside, UK: Barnfield & Buchstaller 2010
 - NW Indiana, USA: José 2010, 2014
 - Philly, USA: e.g., Labov, Rosenfelder, & Freuhwald 2013
 - Hybrid studies: same speakers AND different speakers
 - {Stability / Change} in both individuals and communities
 - Virrat, Finland: Nahkola & Saanilahti 2004
 - Porto Alegre, Brazil: Zilles 2005
 - Montréal, Canada: Sankoff & Blondeau 2007

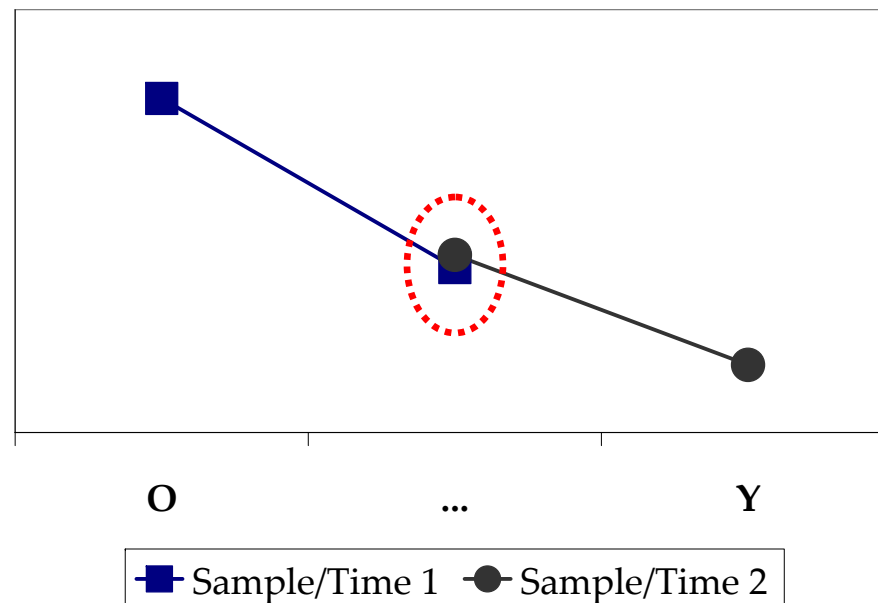
1. Research on language change in progress

- **Some** examples of generational (apparent-time) profiles + resolution

Based on Labov (1994: 83), as modified by Sankoff (2005)

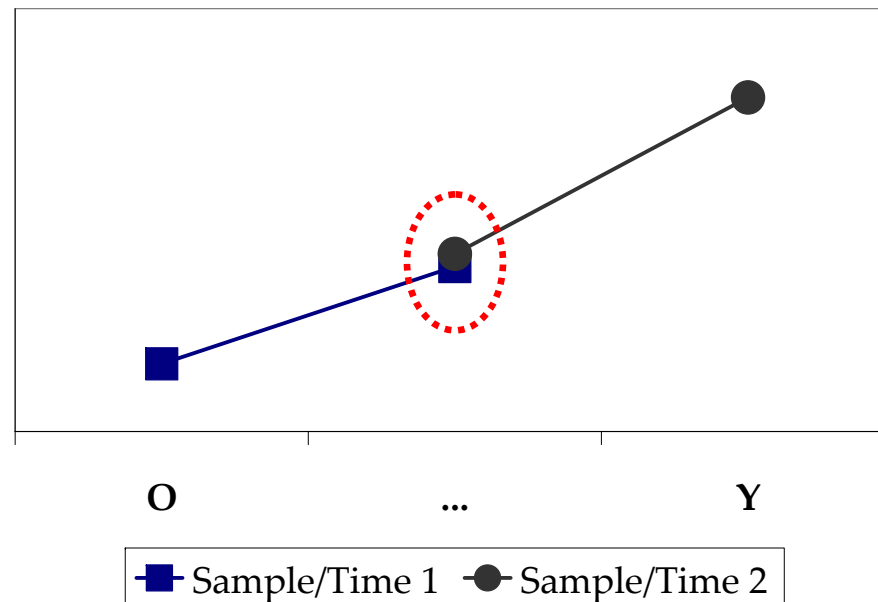
1. Research on language change in progress

- **Some** examples of generational (apparent-time) profiles + resolution
Based on Labov (1994: 83), as modified by Sankoff (2005)
 - Generational differences + consistent individuals
 - Language change; here, a recessive feature



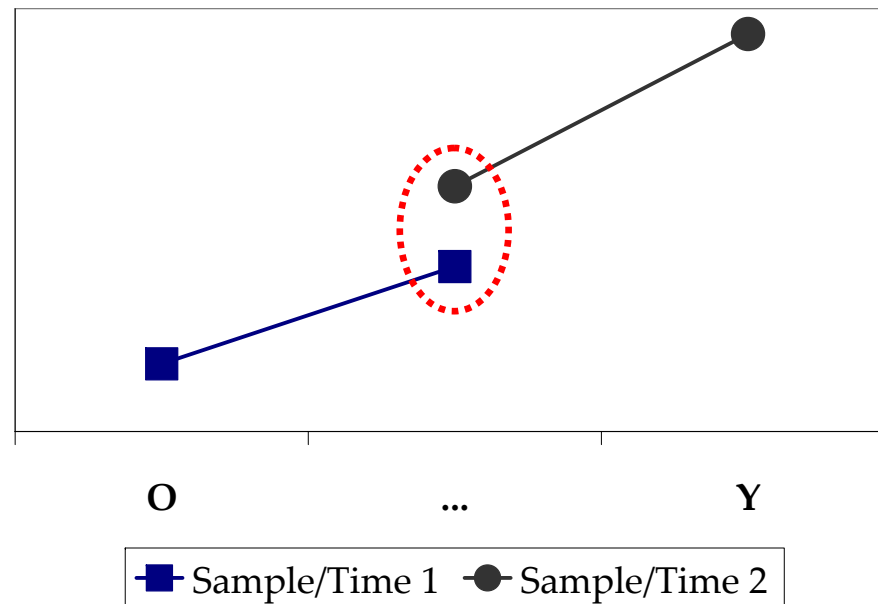
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 - Language change; here, an innovative feature



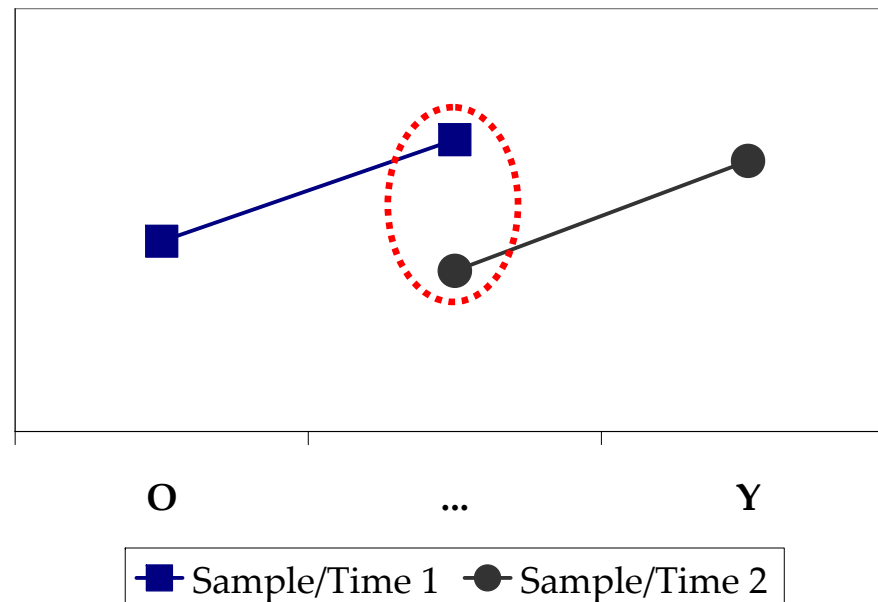
1. Research on language change in progress

- **Some** examples of generational (apparent-time) profiles + resolution
Based on Labov (1994: 83), as modified by Sankoff (2005)
 - Generational differences + inconsistent individuals
 - Language change with lifespan change; here, an innovation



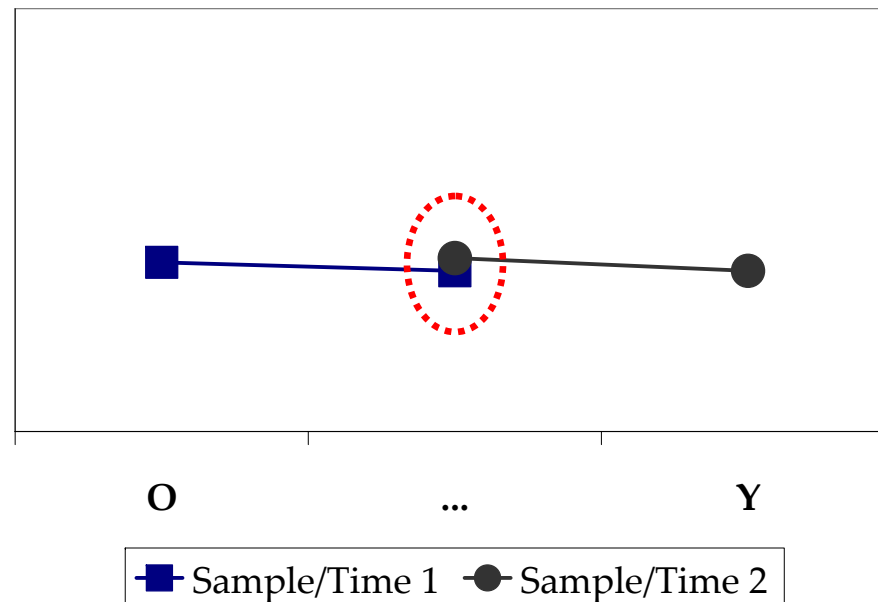
1. Research on language change in progress

- **Some** examples of generational (apparent-time) profiles + resolution
Based on Labov (1994: 83), as modified by Sankoff (2005)
 - Generational differences + inconsistent individuals
 - Linguistic stability with “age grading”



1. Research on language change in progress

- **Some** examples of generational (apparent-time) profiles + resolution
Based on Labov (1994: 83), as modified by Sankoff (2005)
 - No generational differences + consistent individuals
 - Linguistic stability plain and simple



2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland



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SOUNDS OF THE CITY



Fine phonetic variation and sound change: A real-time study of Glaswegian
<http://soundsofthecity.arts.gla.ac.uk/>



Oct 2011-Dec 2014

The Leverhulme Trust

2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.1. Corpus design

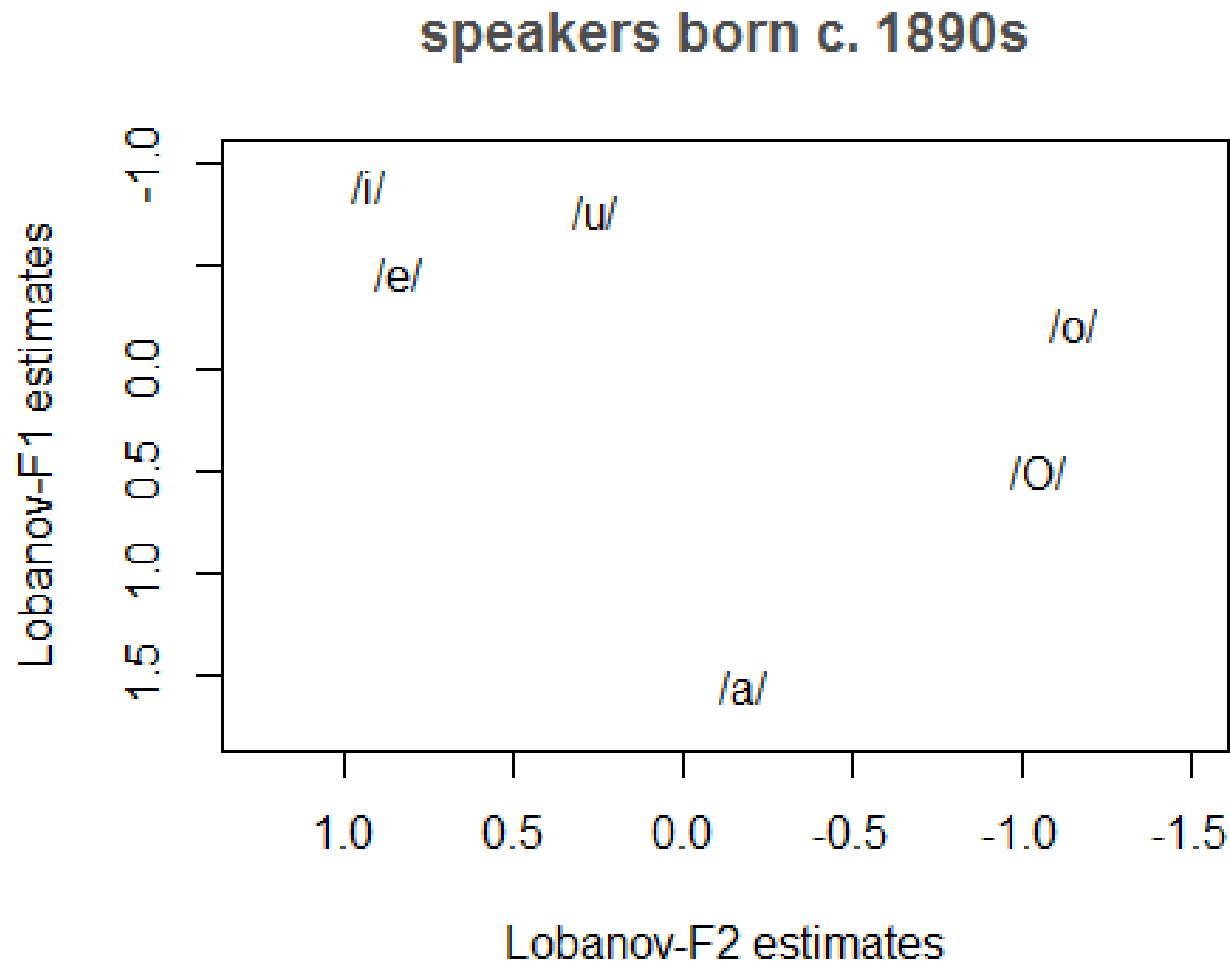
- Real time: ≈ 30 years (4 decades: 1970s, 1980s, 1990s, 2000s)
- Apparent time: ≈ 100 years (3 groups: elderly, adult, adolescent)
- Various recording types

2.2. Data summary

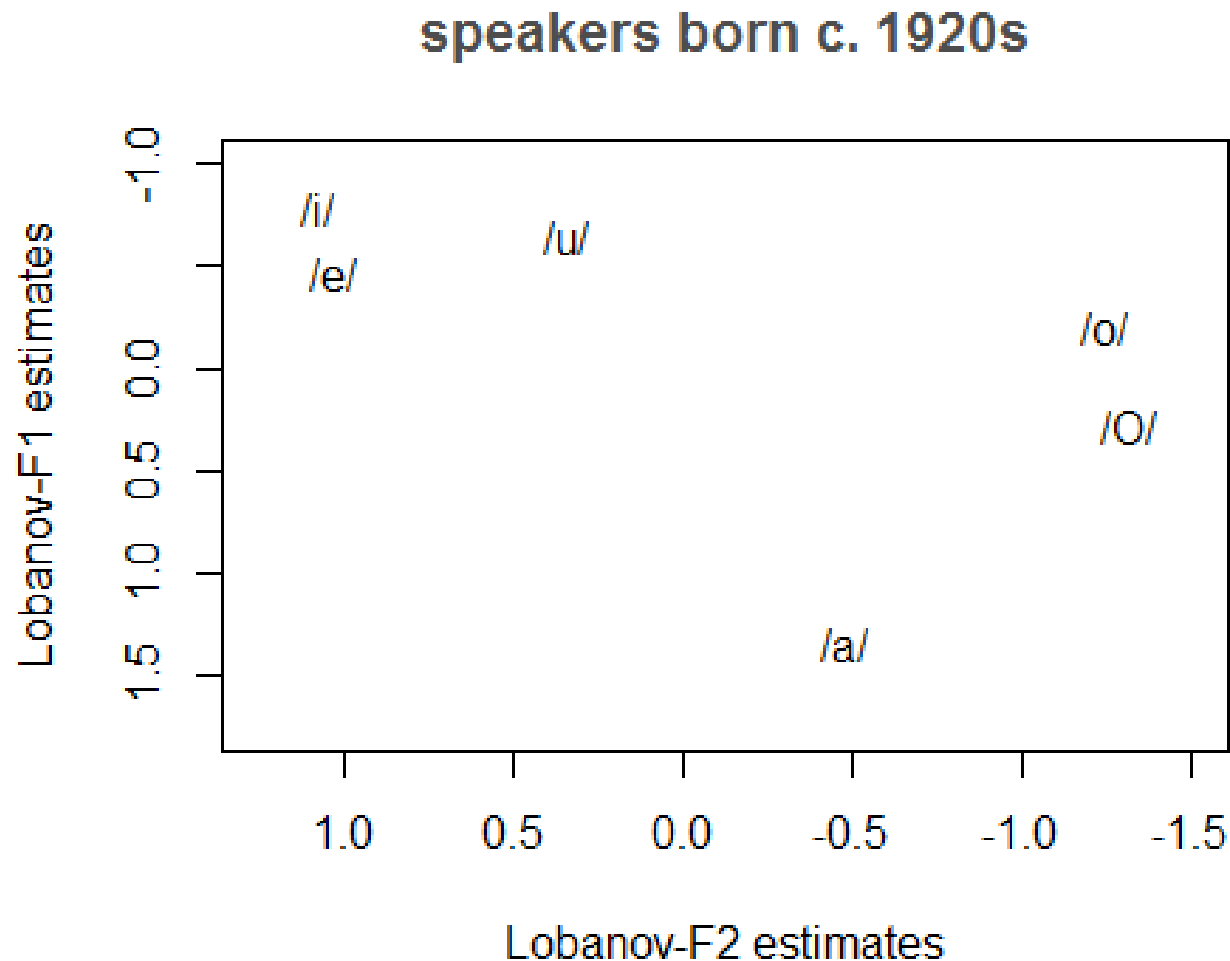
- 31 speakers
- 6 vowel types
- ≈ 14000 vowel tokens

Glasgow <i>sub-sample</i>		1970s		2000s		Totals
		M	F	M	F	
Age Group	Elderly	4	3	4	4	15
	Adult					
	Children	4	4	4	4	16
Totals		8	7	8	8	31
		15		16		

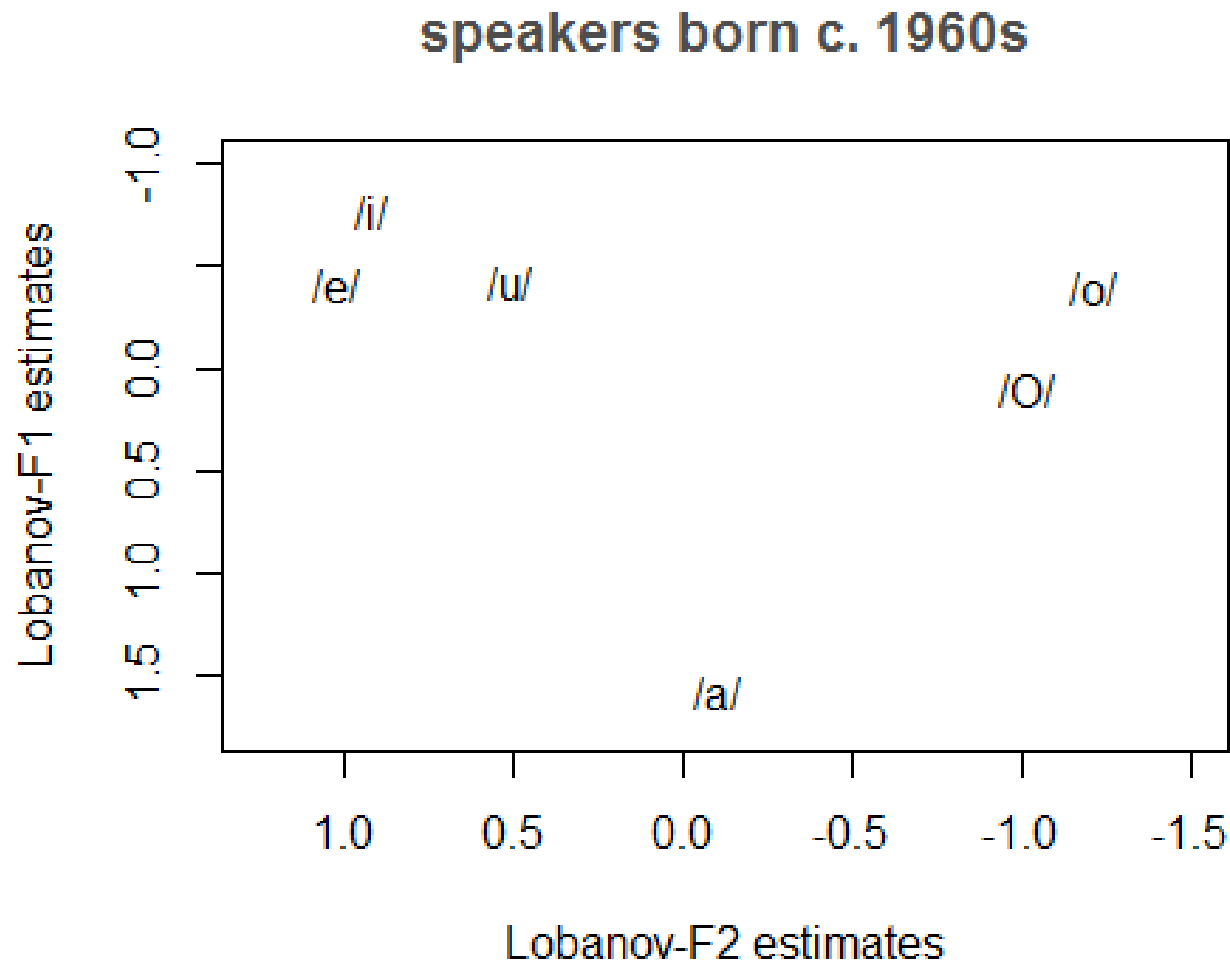
2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland
 - 2.3. Vowel subsystem by speakers' (approx / avg) decade of birth



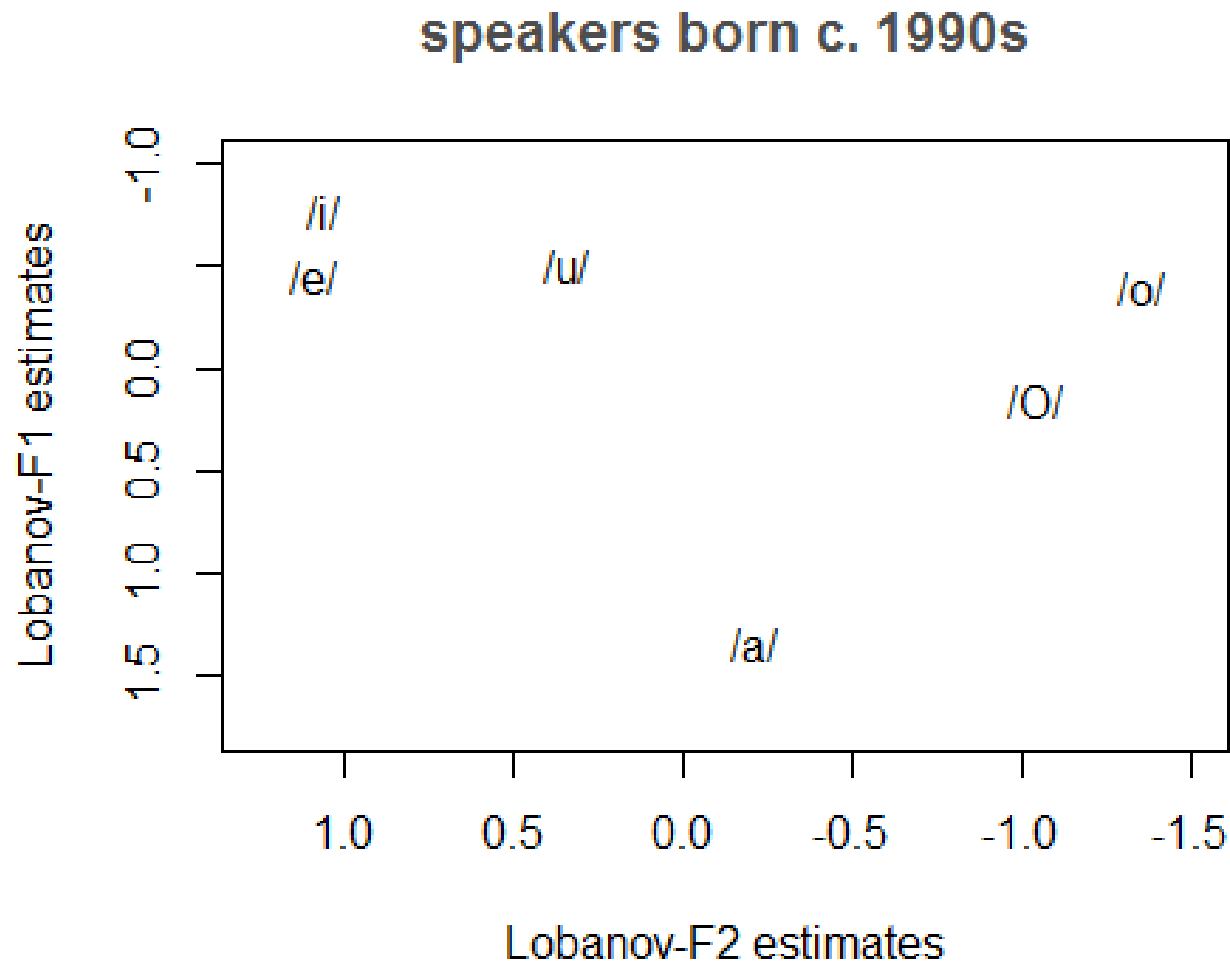
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 - 2.3. Vowel subsystem by speakers' (approx / avg) decade of birth



2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.4. Statistical results: Overall overview, testing only *age-time*

		Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr (>F)
FLEECE	F1	0.6236	0.2079	3	26.3	1.201	0.329
	F2	0.7824	0.2608	3	27.1	0.656	0.586
FACE	F1	0.0500	0.0167	3	26.8	0.181	0.908
	F2	1.2297	0.4099	3	28.3	1.539	0.226
BOOT	F1	5.5947	1.8649	3	27.5	15.182	0.000005
	F2	1.4811	0.4937	3	24.5	2.365	0.096
GOAT	F1	1.8981	0.6327	3	26.0	4.013	0.018
	F2	2.9026	0.9675	3	23.2	2.198	0.115
LOT	F1	3.6784	1.2262	3	27.4	5.048	0.007
	F2	6.6742	2.2247	3	25.3	6.128	0.003
CAT	F1	1.4592	0.4864	3	27.4	1.092	0.369
	F2	1.6748	0.5583	3	27.9	3.419	0.031

{Significance~Non-significance} of *Age-Time* on Normalized Formant Values

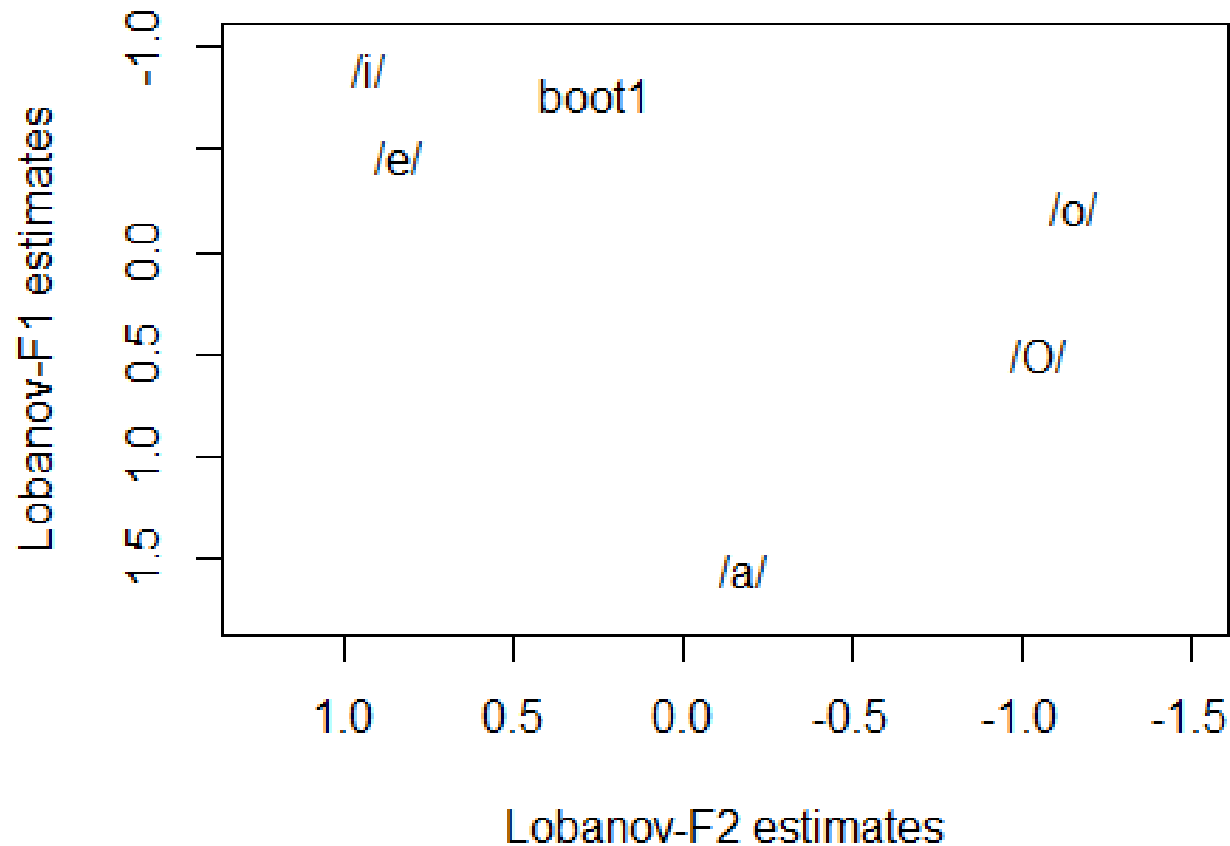
2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.5. Statistical significance of BOOT /ʉ/ lowering

		Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr (>F)
FLEECE	F1	0.6236	0.2079	3	26.3	1.201	0.329
	F2	0.7824	0.2608	3	27.1	0.656	0.586
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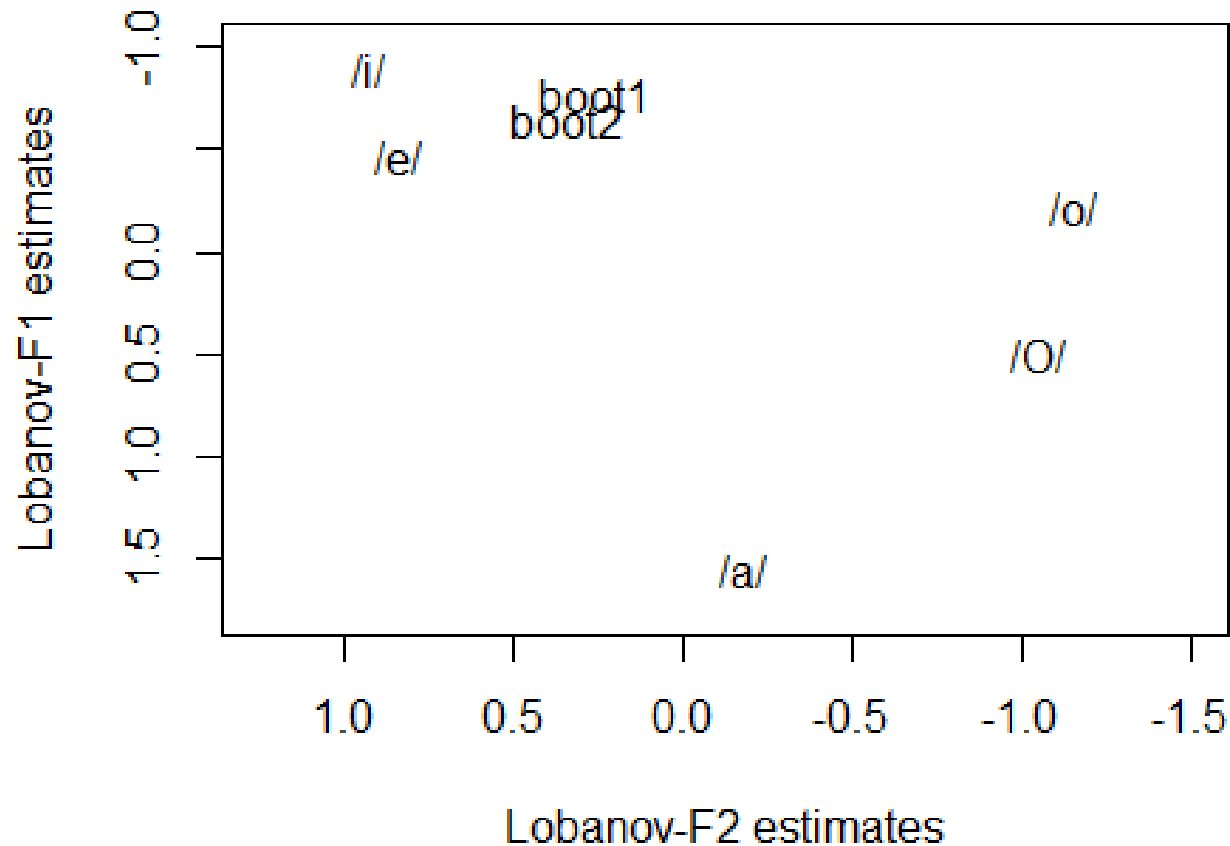
{Significance~Non-significance} of *Age-Time* on Normalized Formant Values

2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland
2.5. BOOT /ʌ/ lowering through real and apparent time

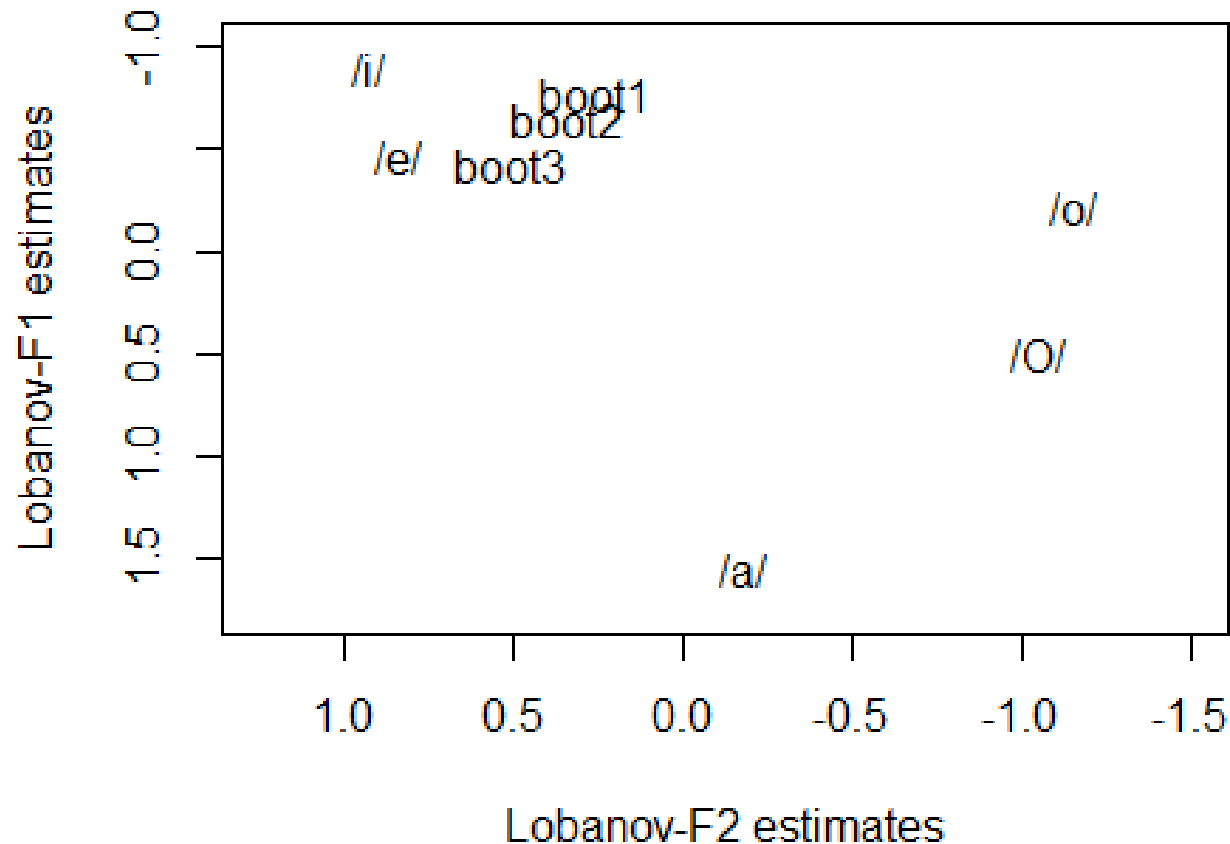


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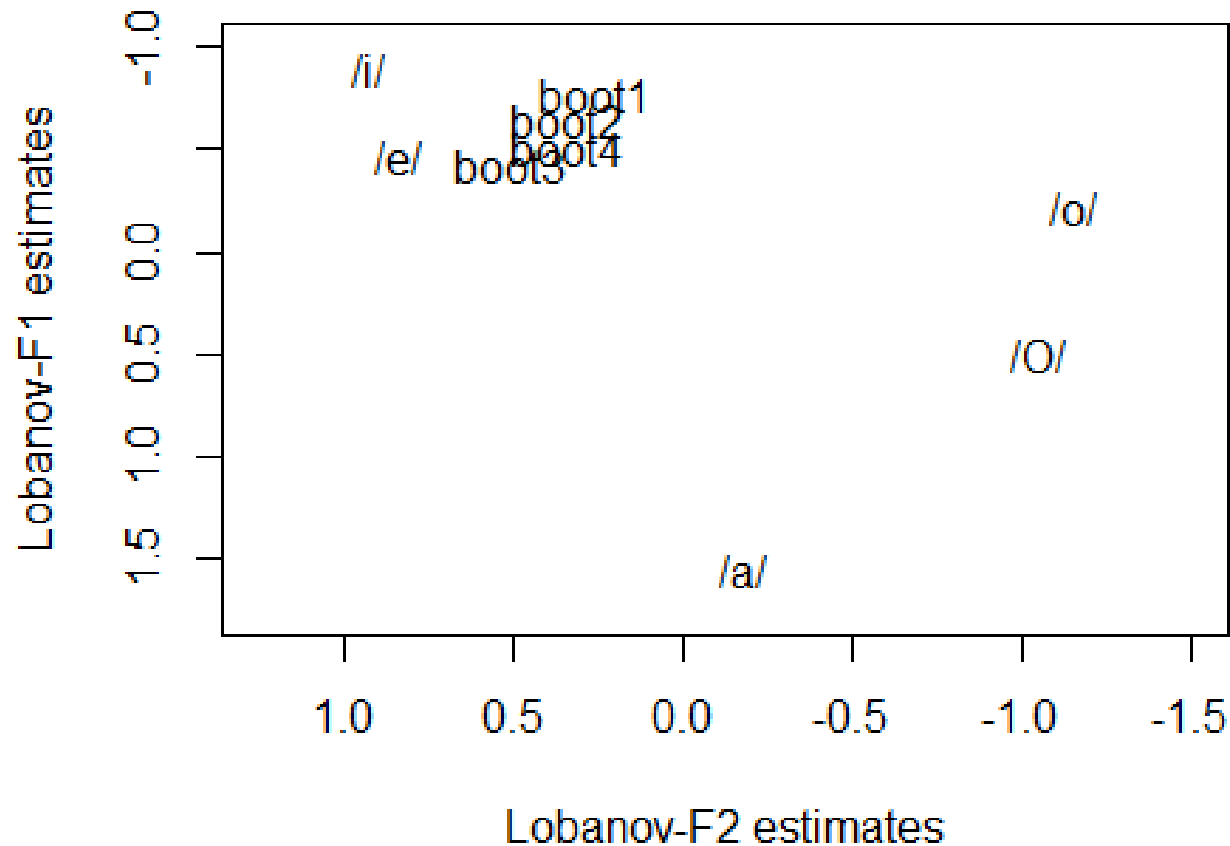


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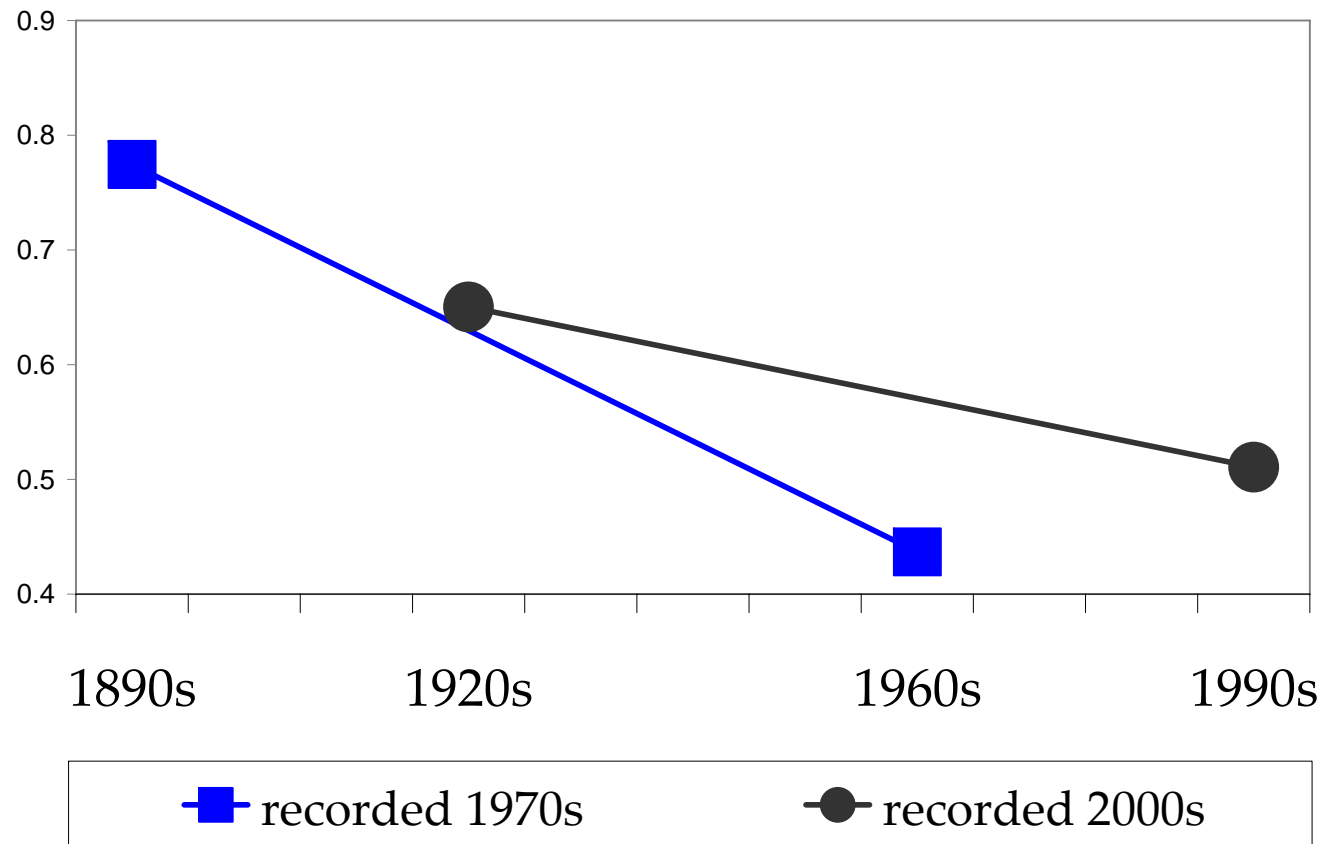
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2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.5. F1 of BOOT modeled in real and apparent time

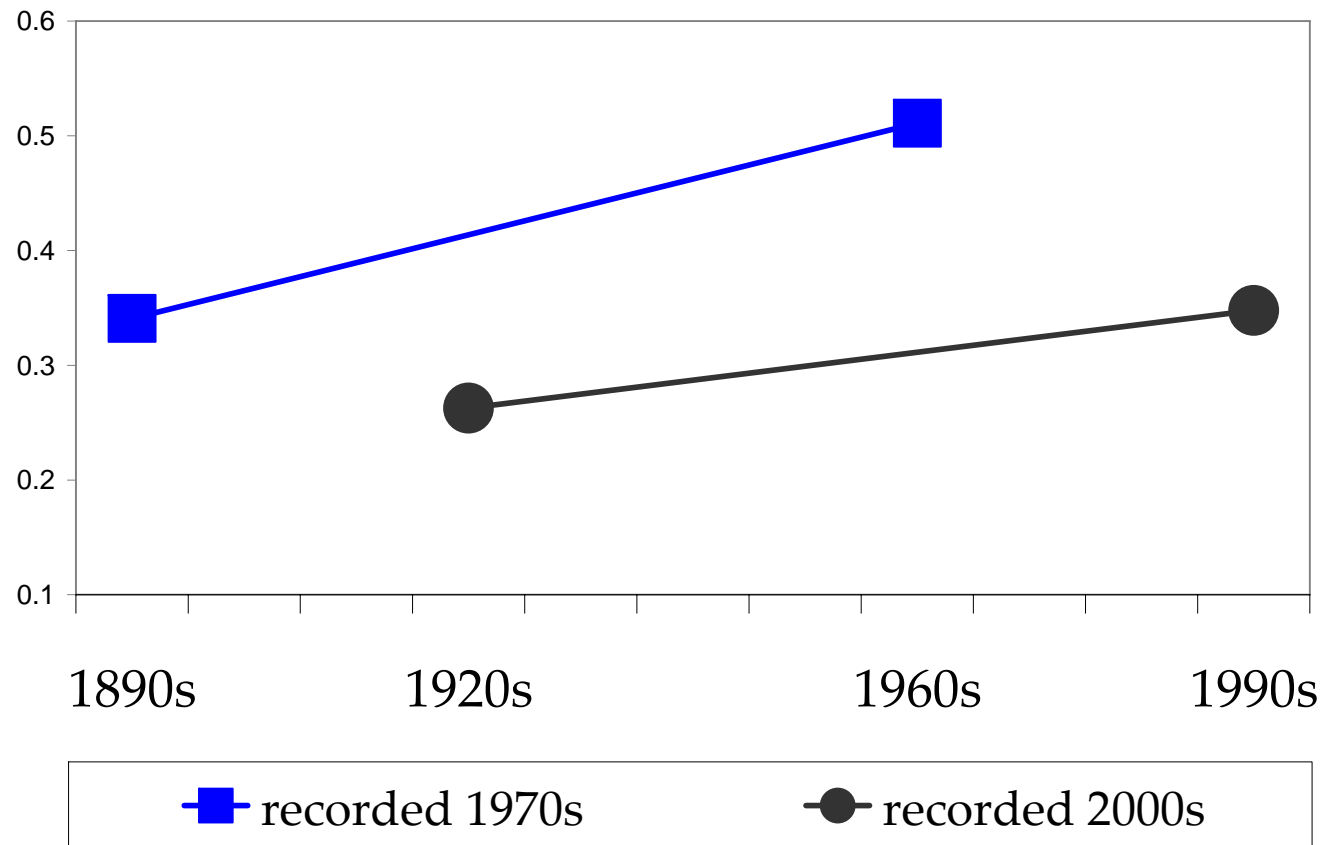
		1890s	1920s	1960s	1990s
F1: age-time group	1890s	X	p<0.05	p<0.001	p<0.001
	1920s	p<0.05	X	p<0.001	p<0.01



2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.5. F2 of BOOT modeled in real and apparent time

F2: age-time group = NS



2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

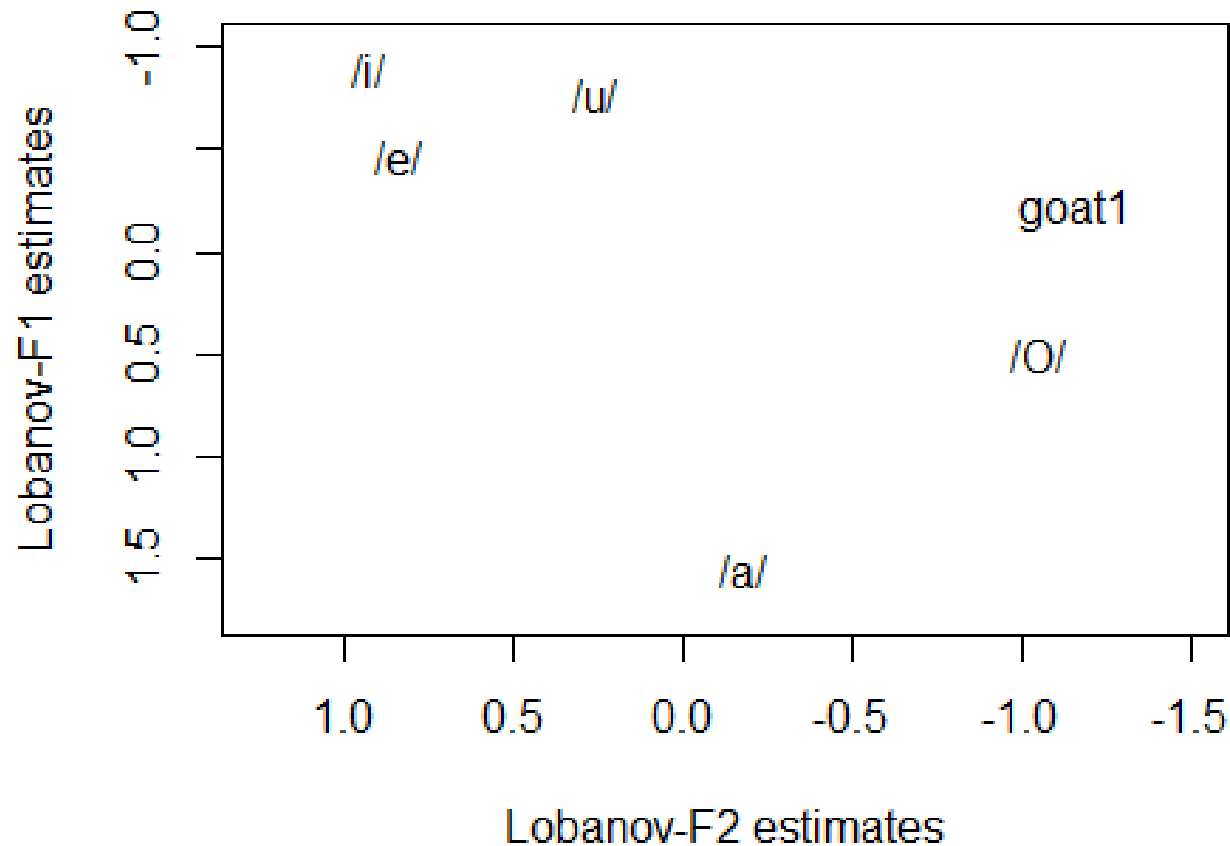
2.6. Statistical significance of GOAT /o/ raising

		Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr (>F)
FLEECE	F1	0.6236	0.2079	3	26.3	1.201	0.329
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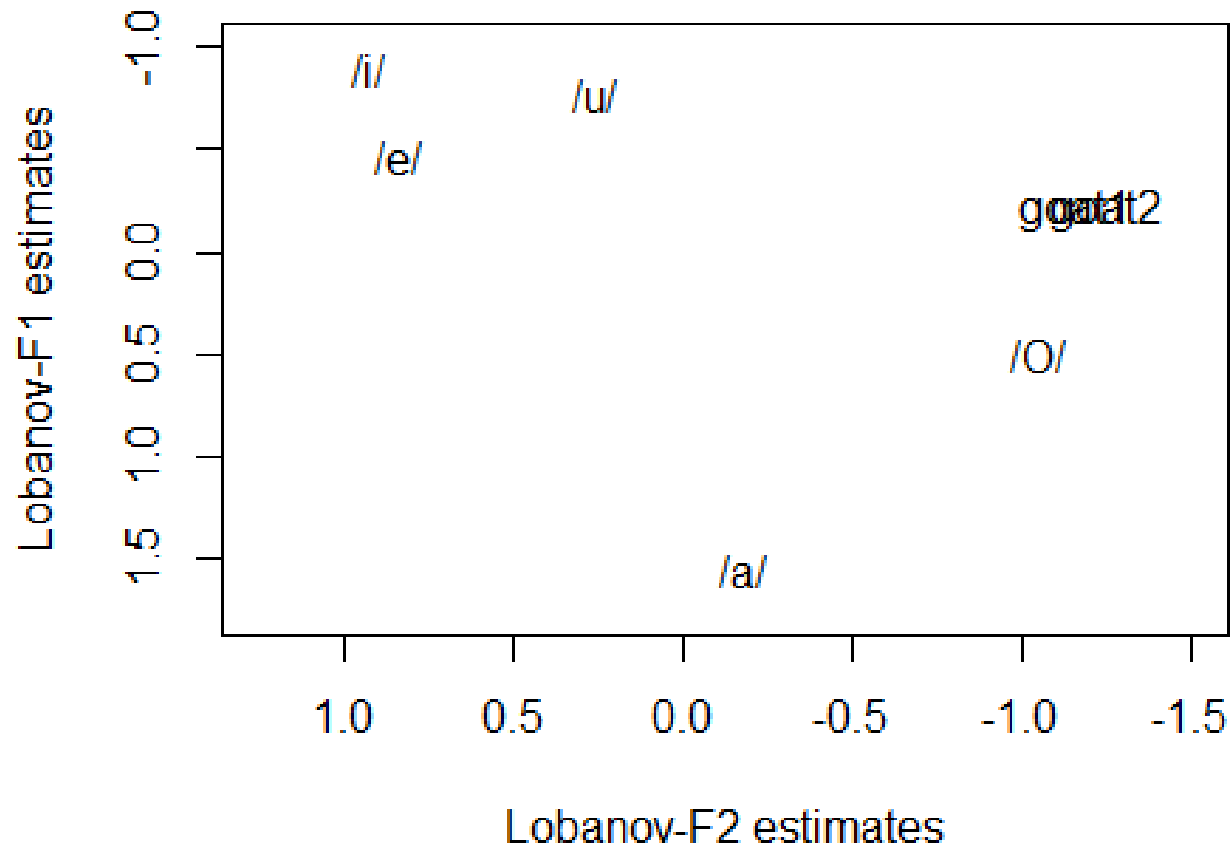
2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.6. GOAT /o/ raising through (real and) apparent time



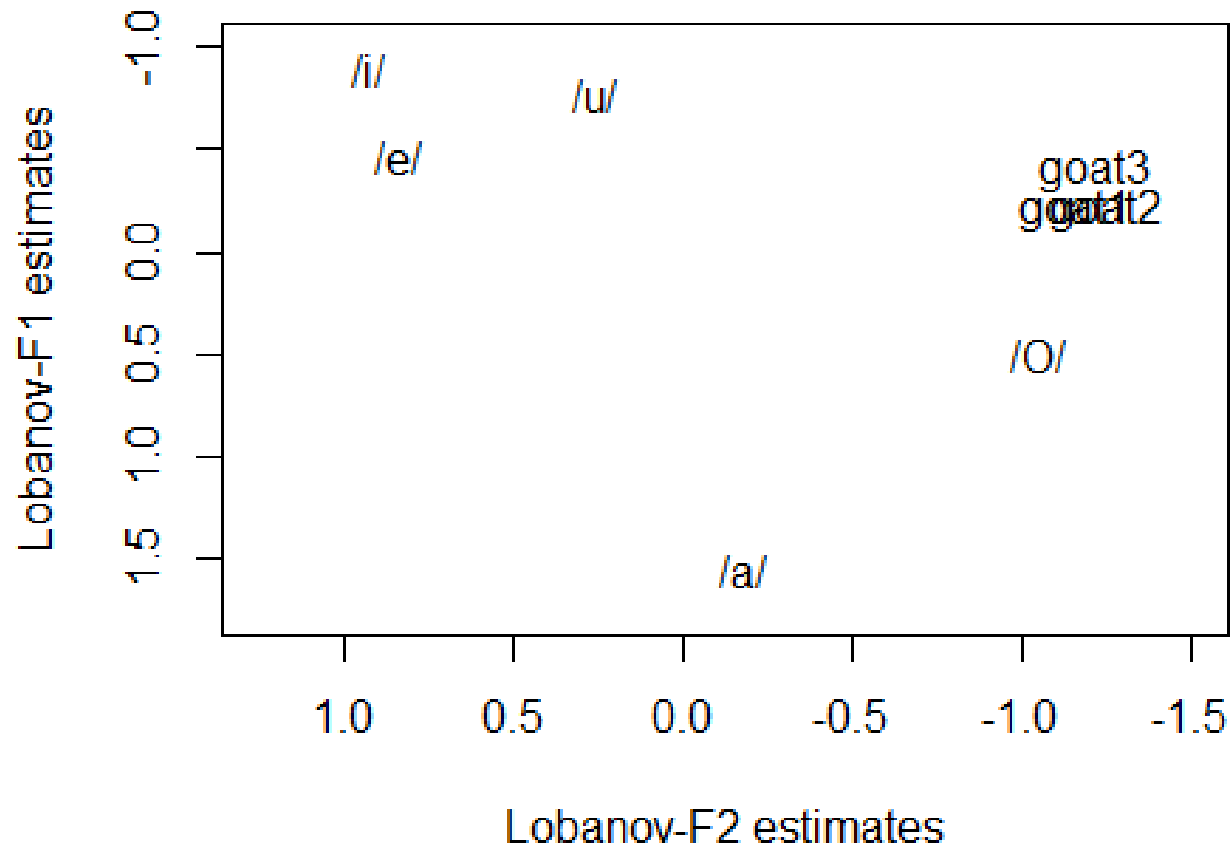
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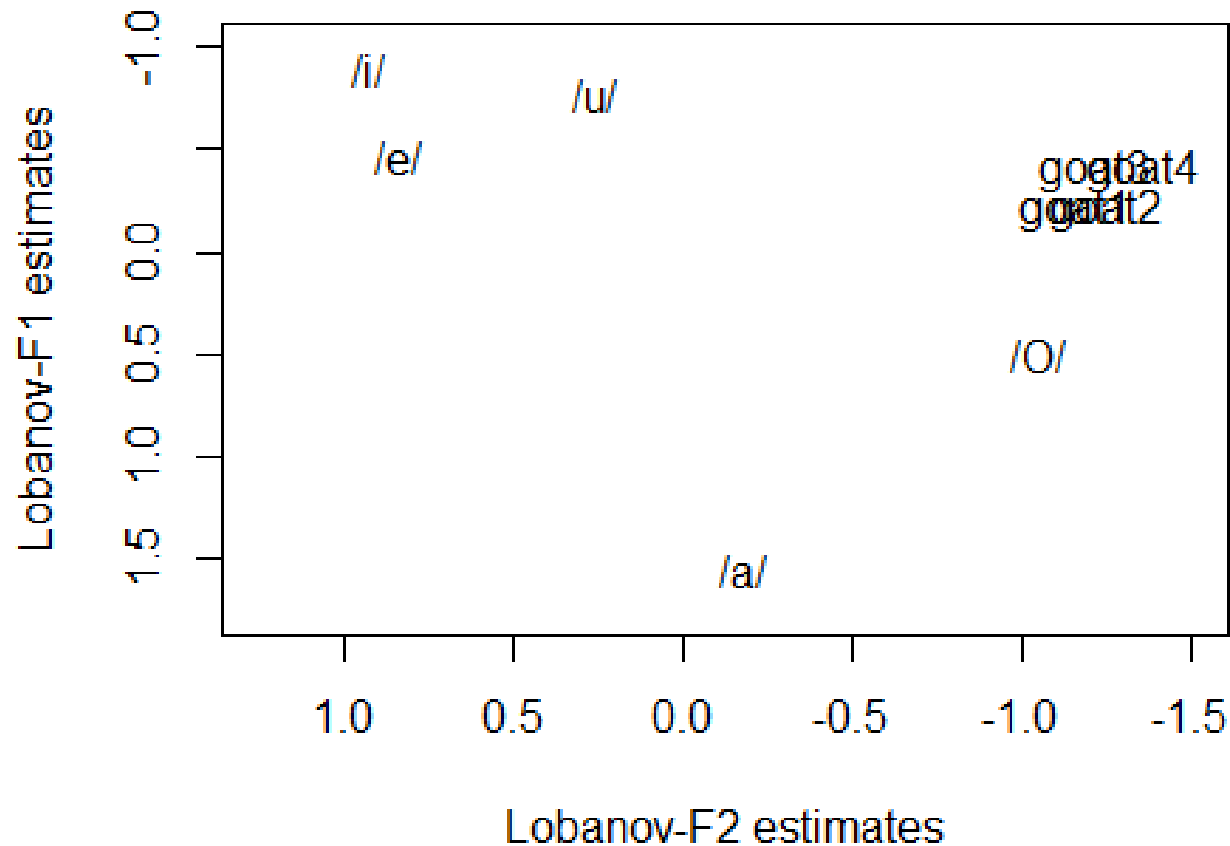
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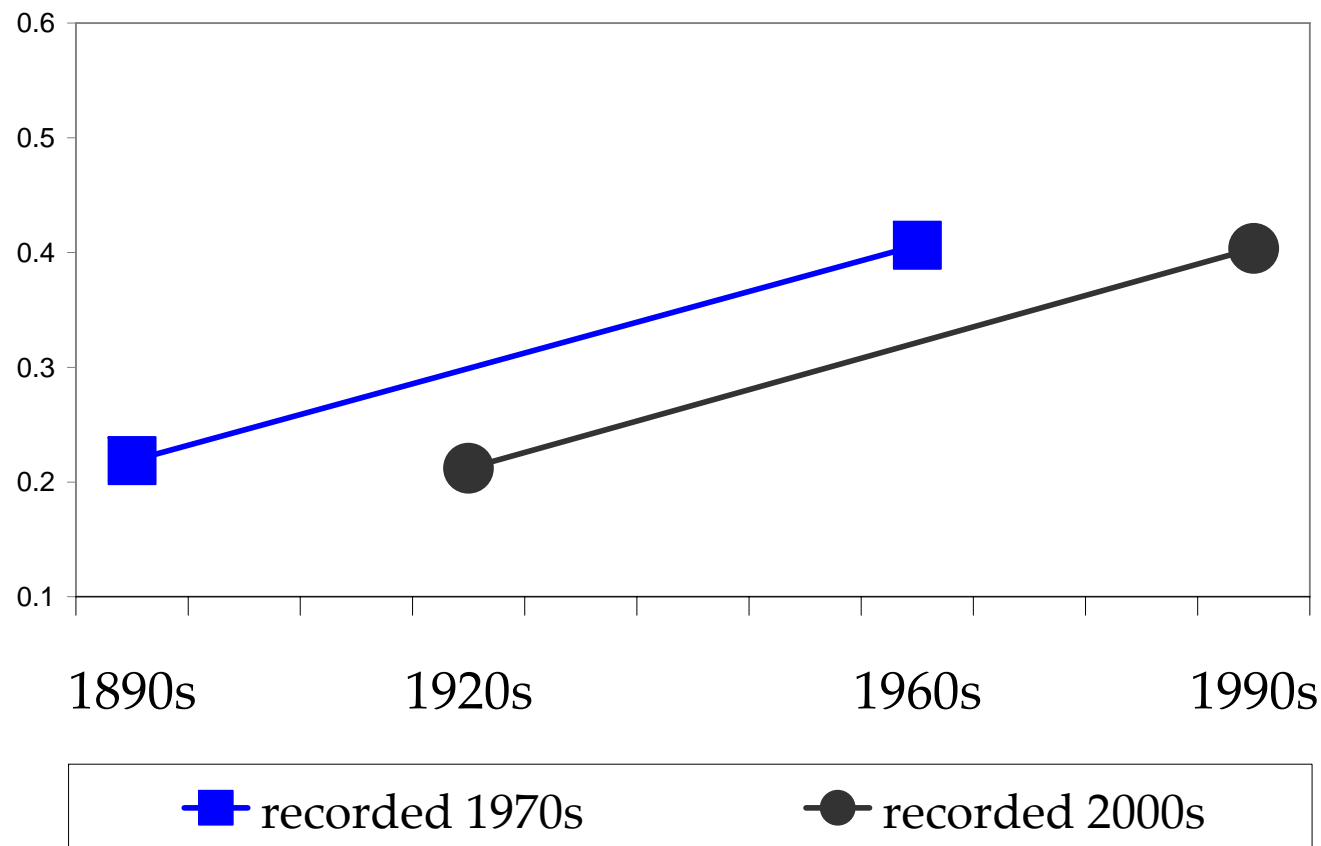


2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.6. F1 of GOAT modeled in real and apparent time

F1: age-time group

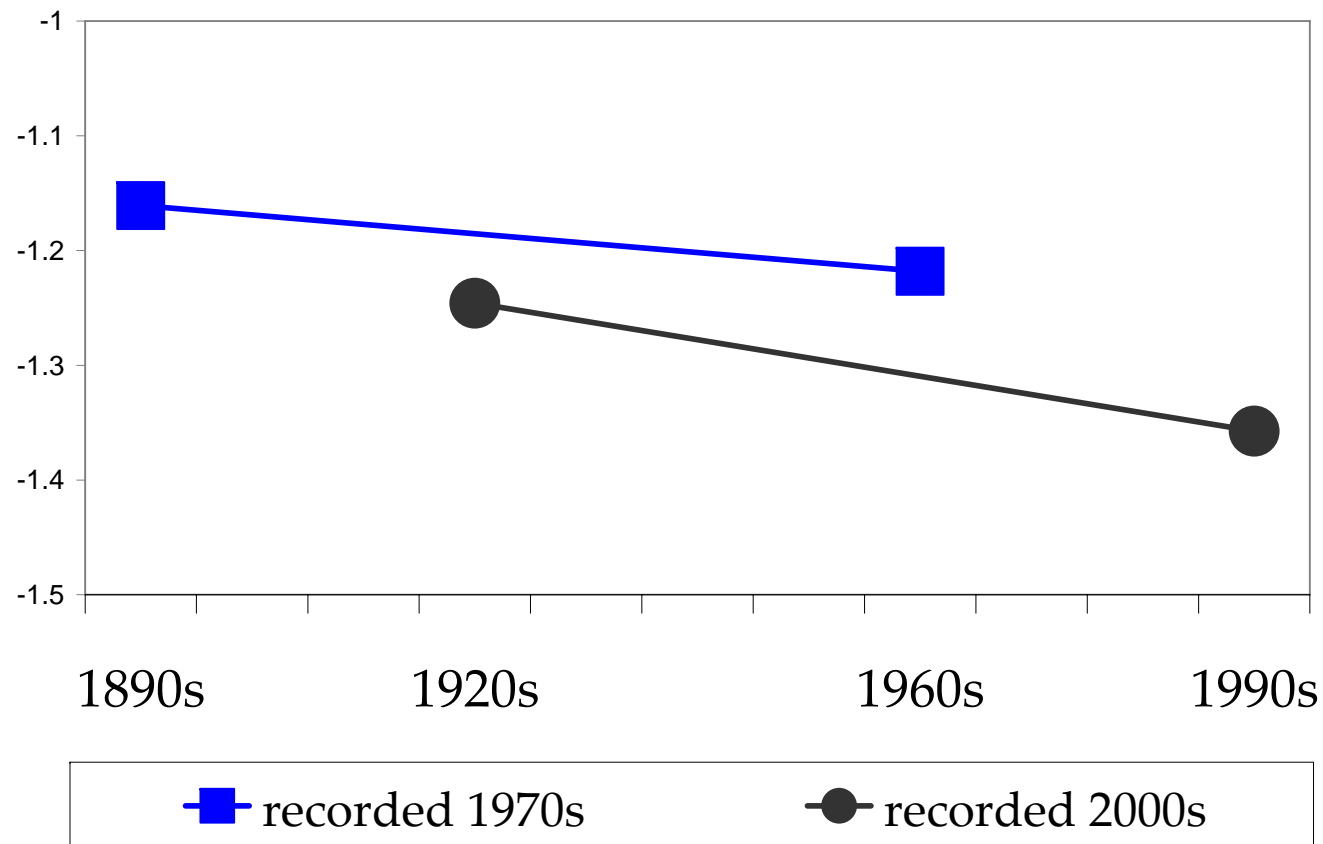
1890s / 1920s vs 1960s / 1990s $p < 0.05$



2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.6. F2 of GOAT modeled in real and apparent time

F2: age-time group = NS



2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

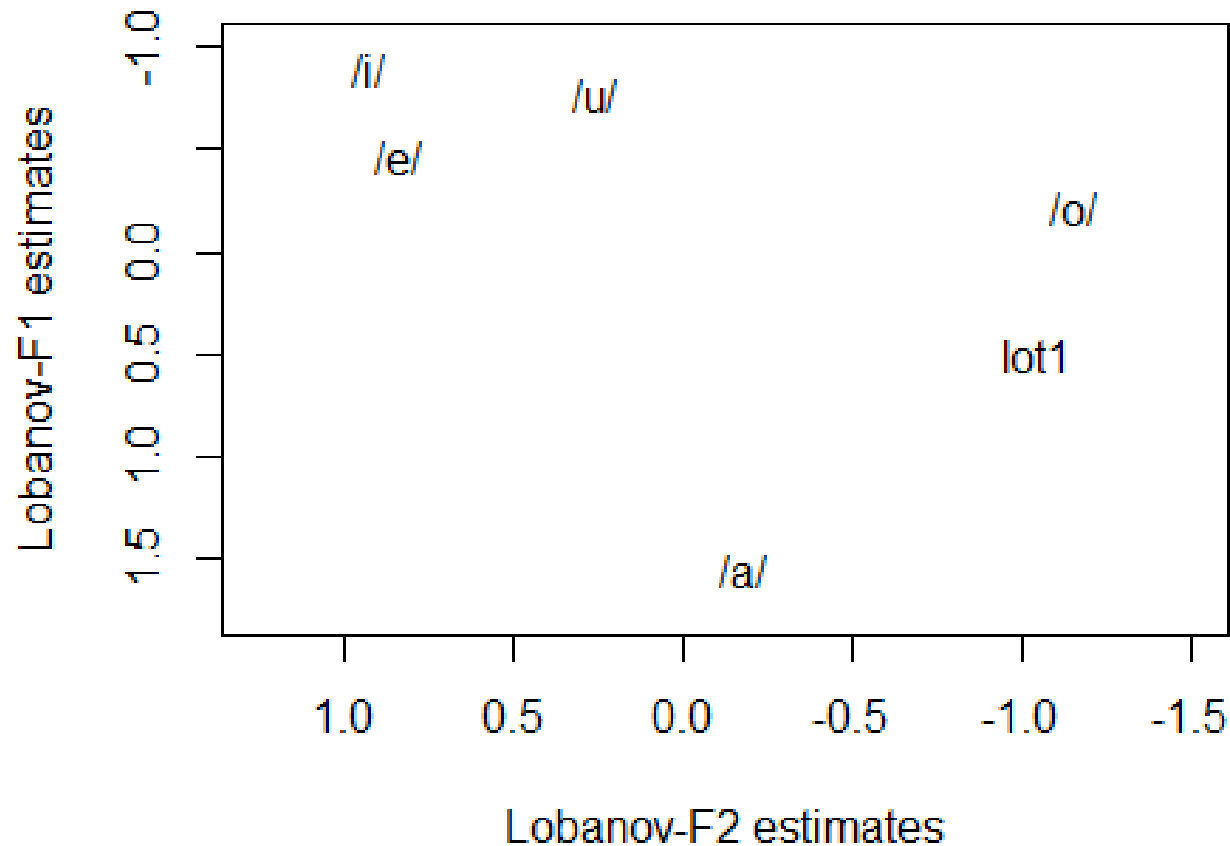
2.7. Statistical significance of LOT /ɔ/ raising (and oscillations on F2)

		Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr (>F)
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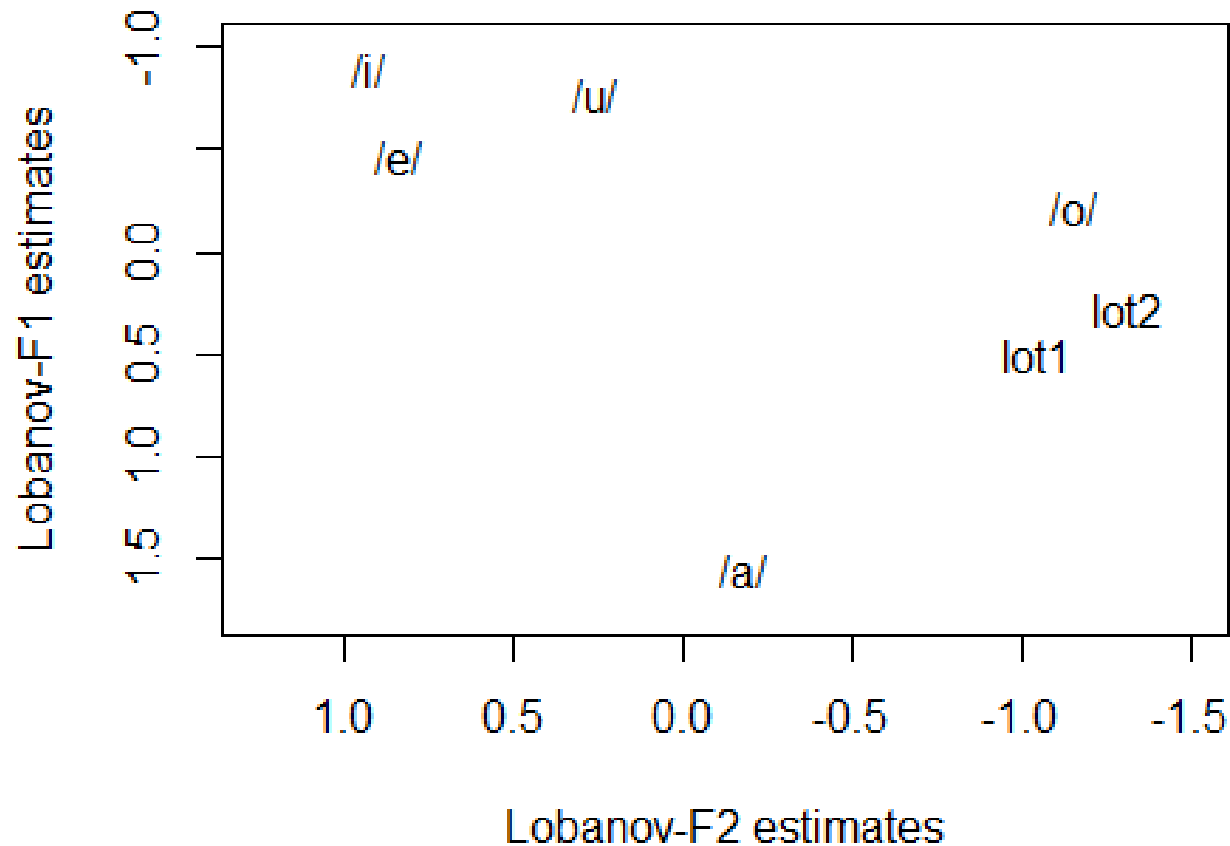
2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.7. LOT /ɔ/ raising through real and apparent time



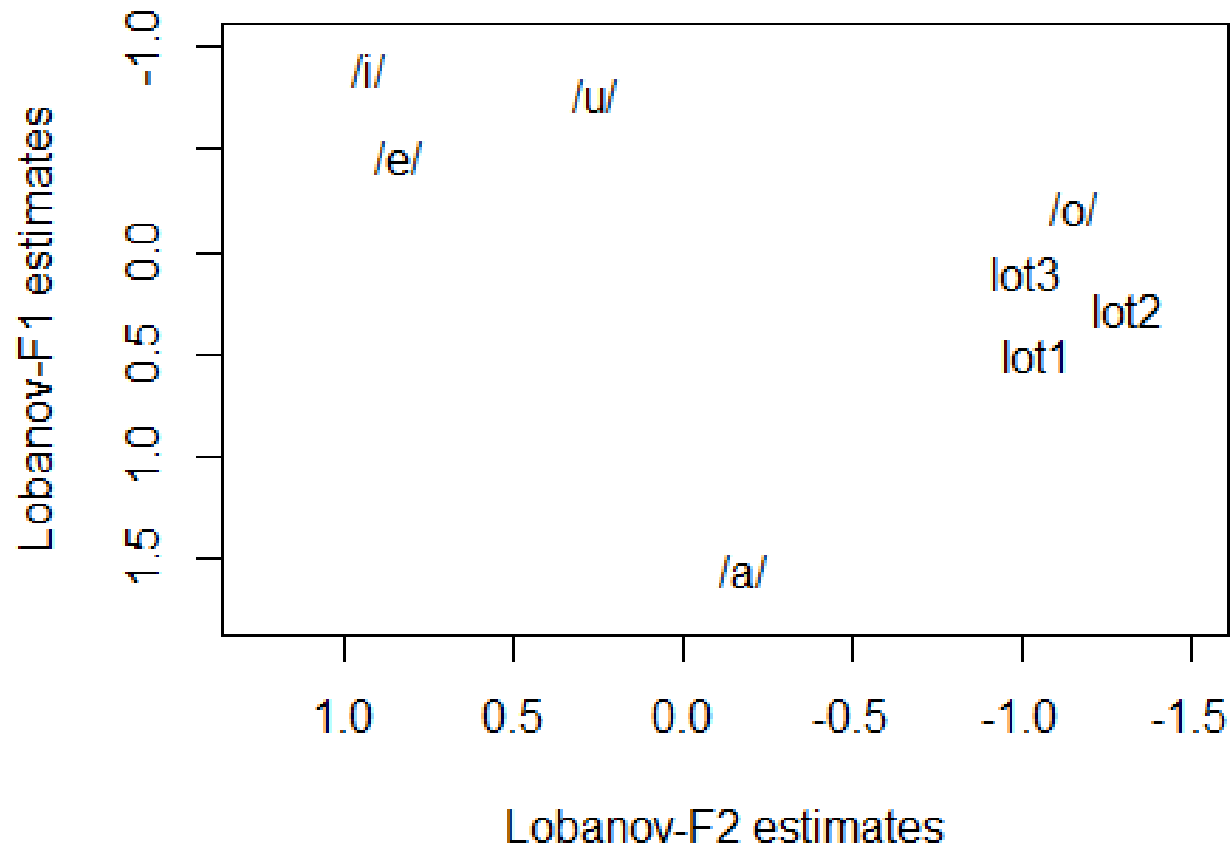
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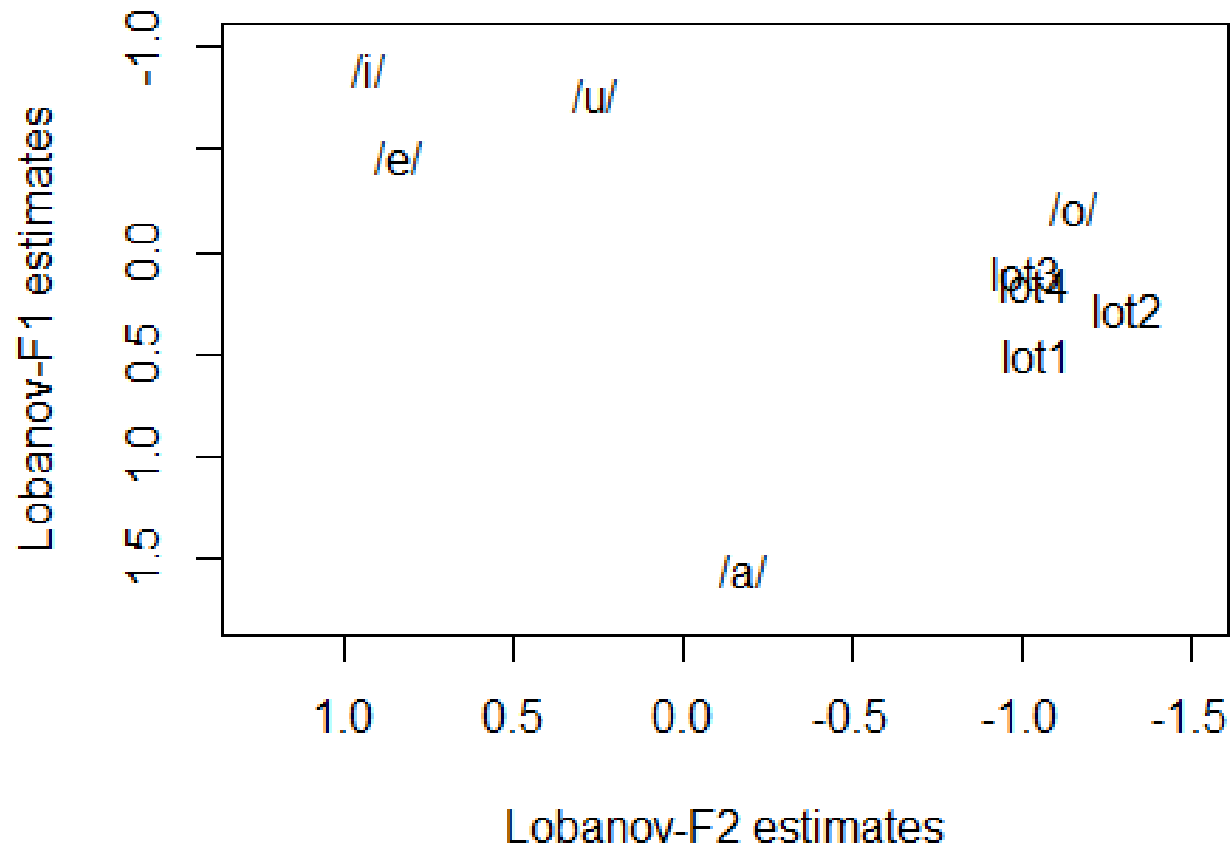
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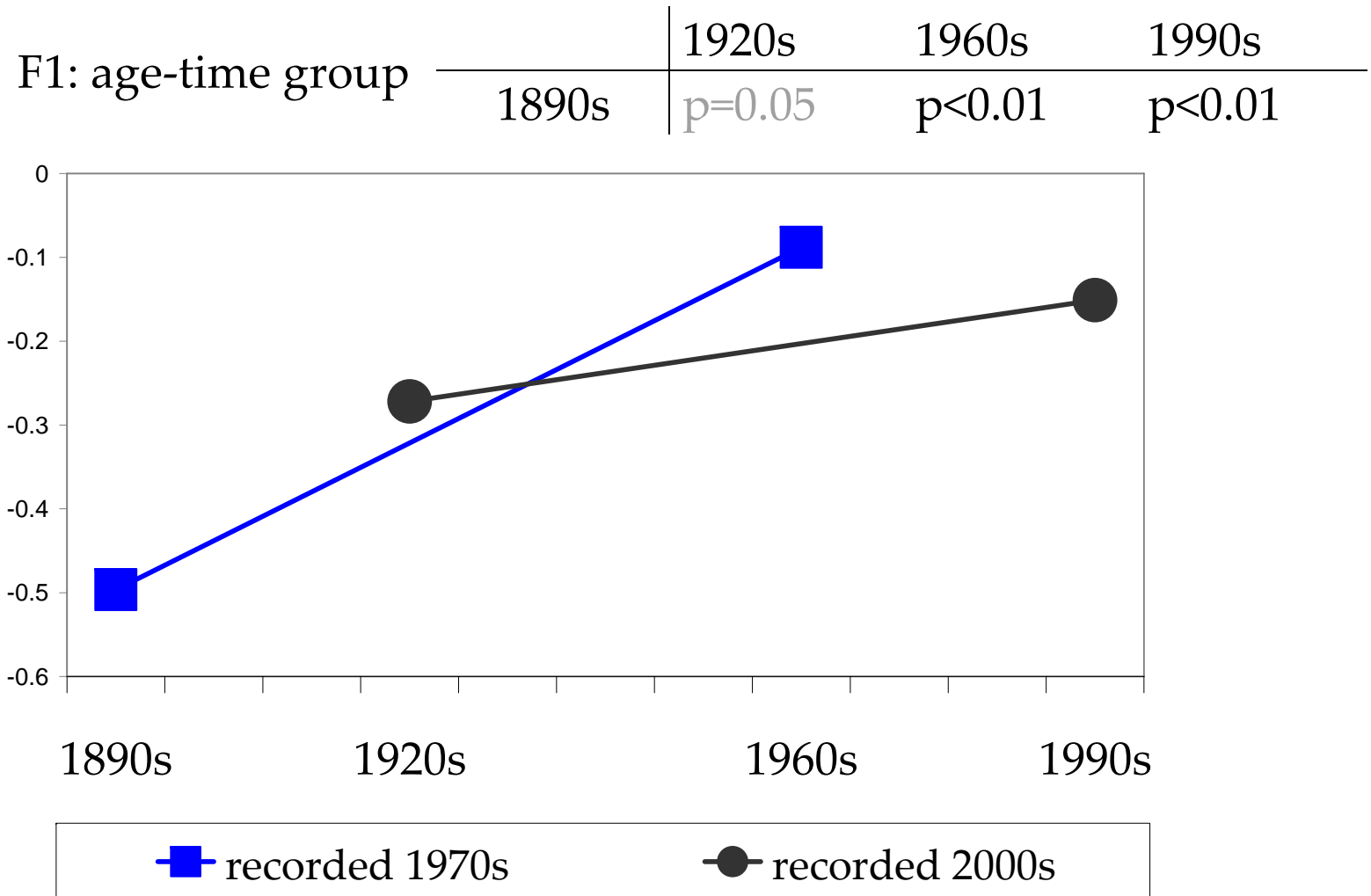
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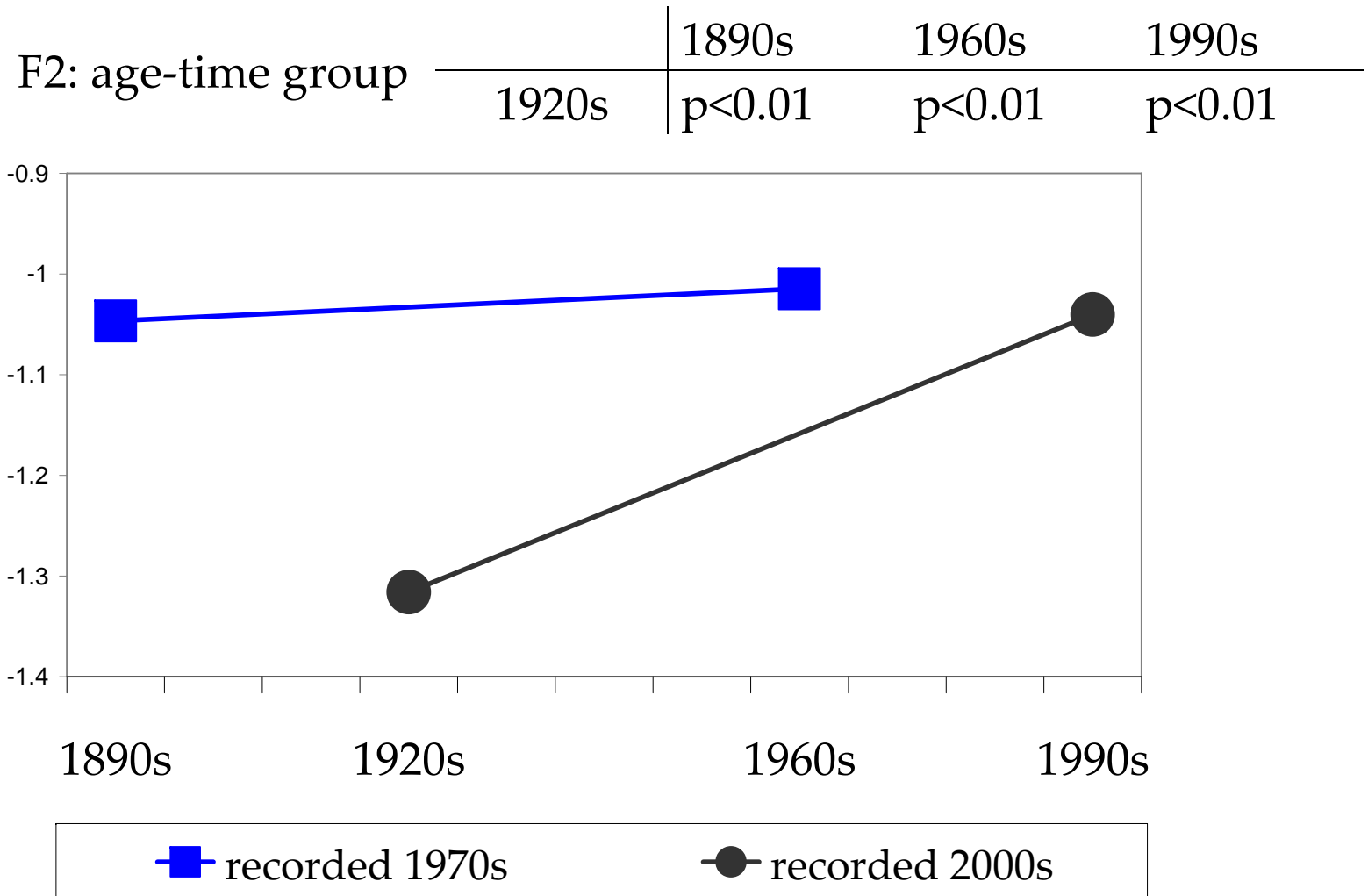
2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.7. F1 of LOT modeled in real and apparent time



2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.7. F2 of LOT modeled in real and apparent time



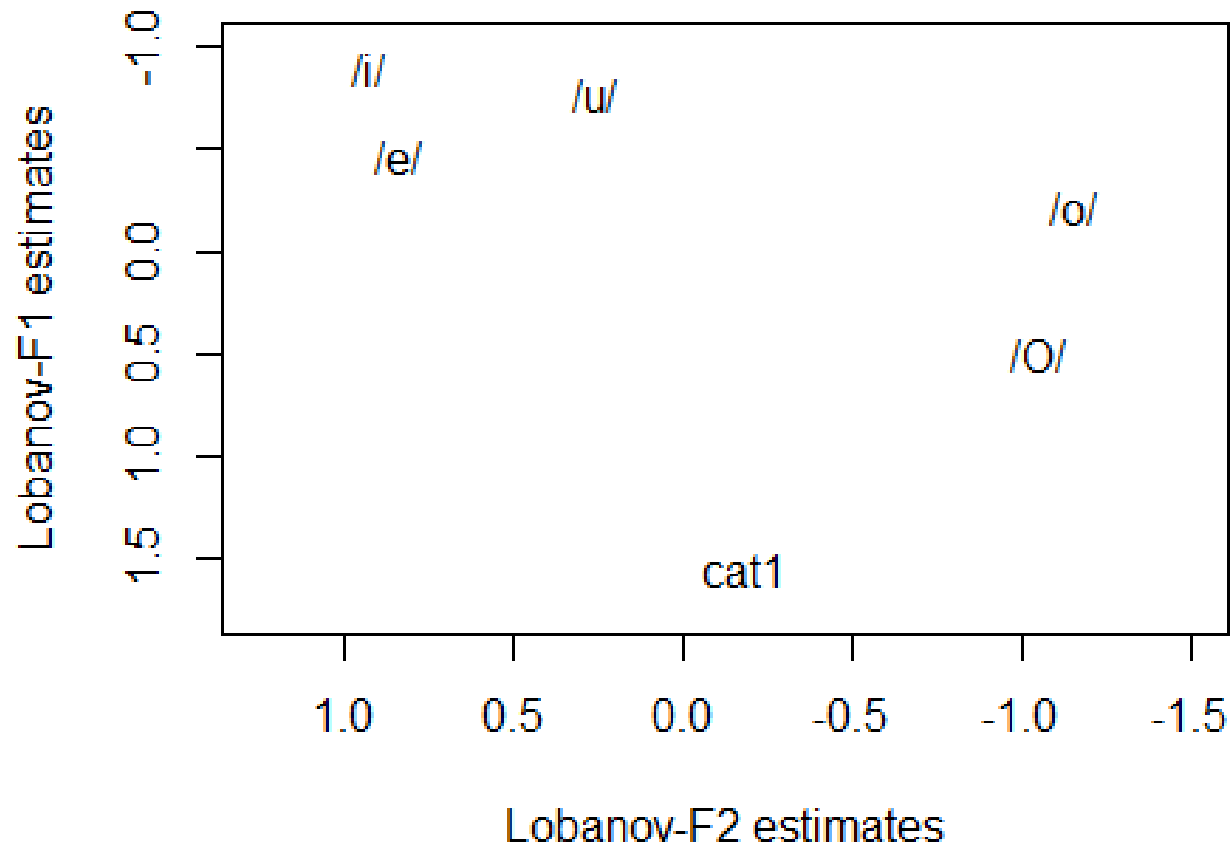
2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland

2.8. Statistical significance of CAT /a/ oscillations on F2

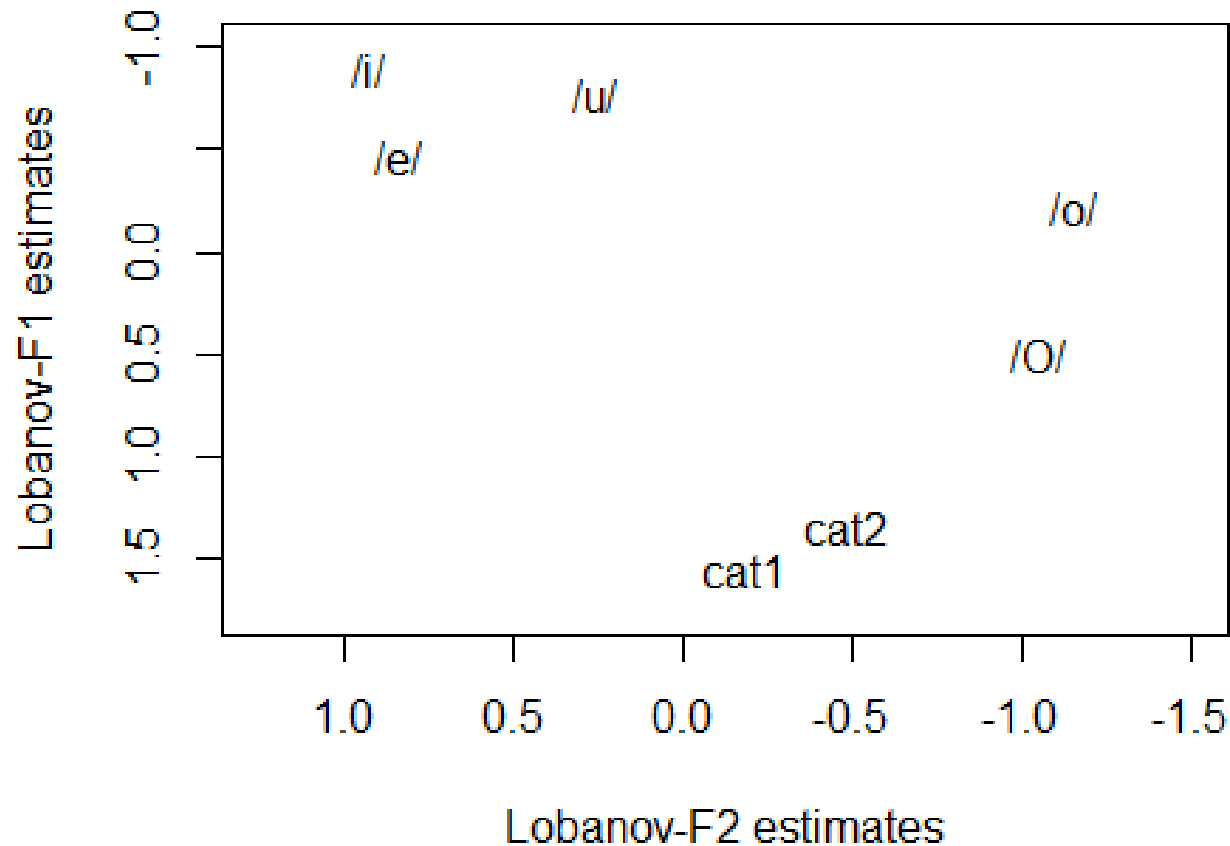
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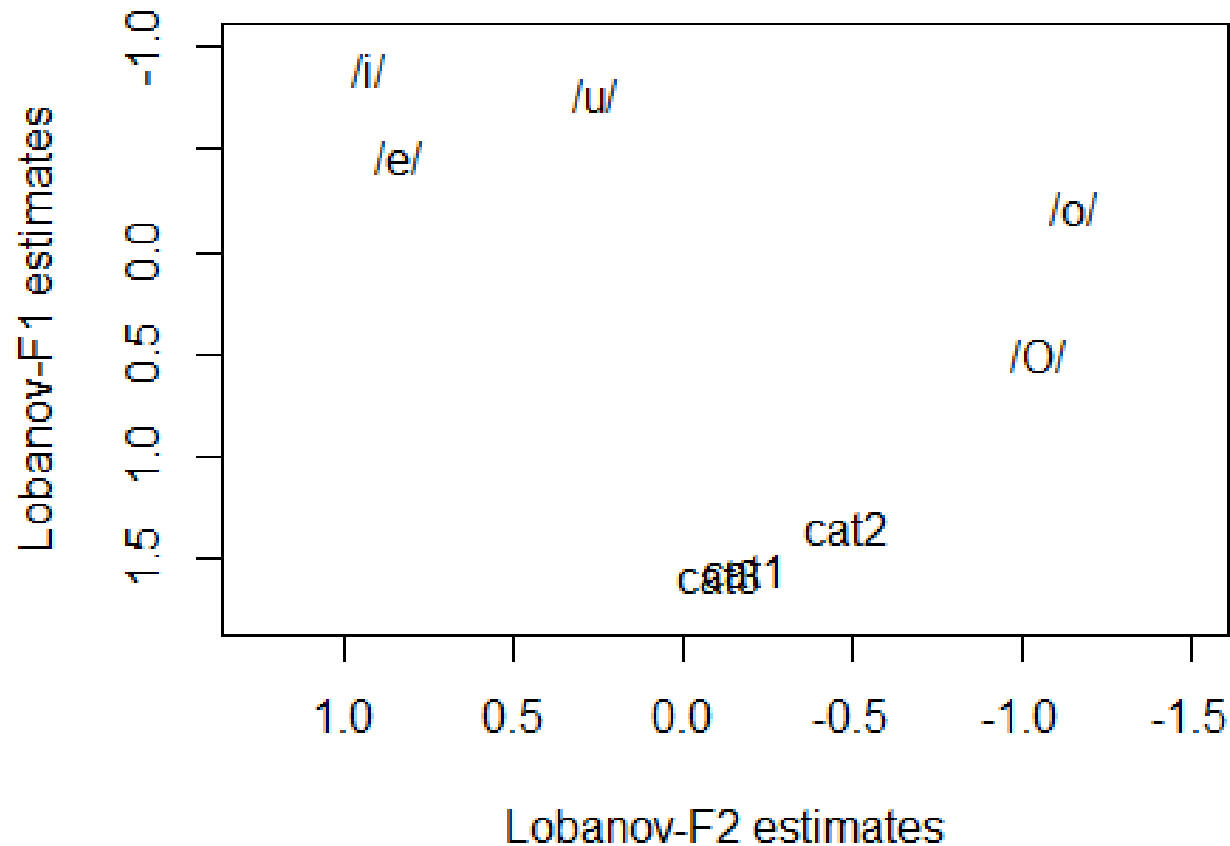
2. Real-time, cross-sectional socio-ling/phon research in Glasgow, Scotland
 - 2.8. (The stability of?) CAT /a/ through real and apparent time



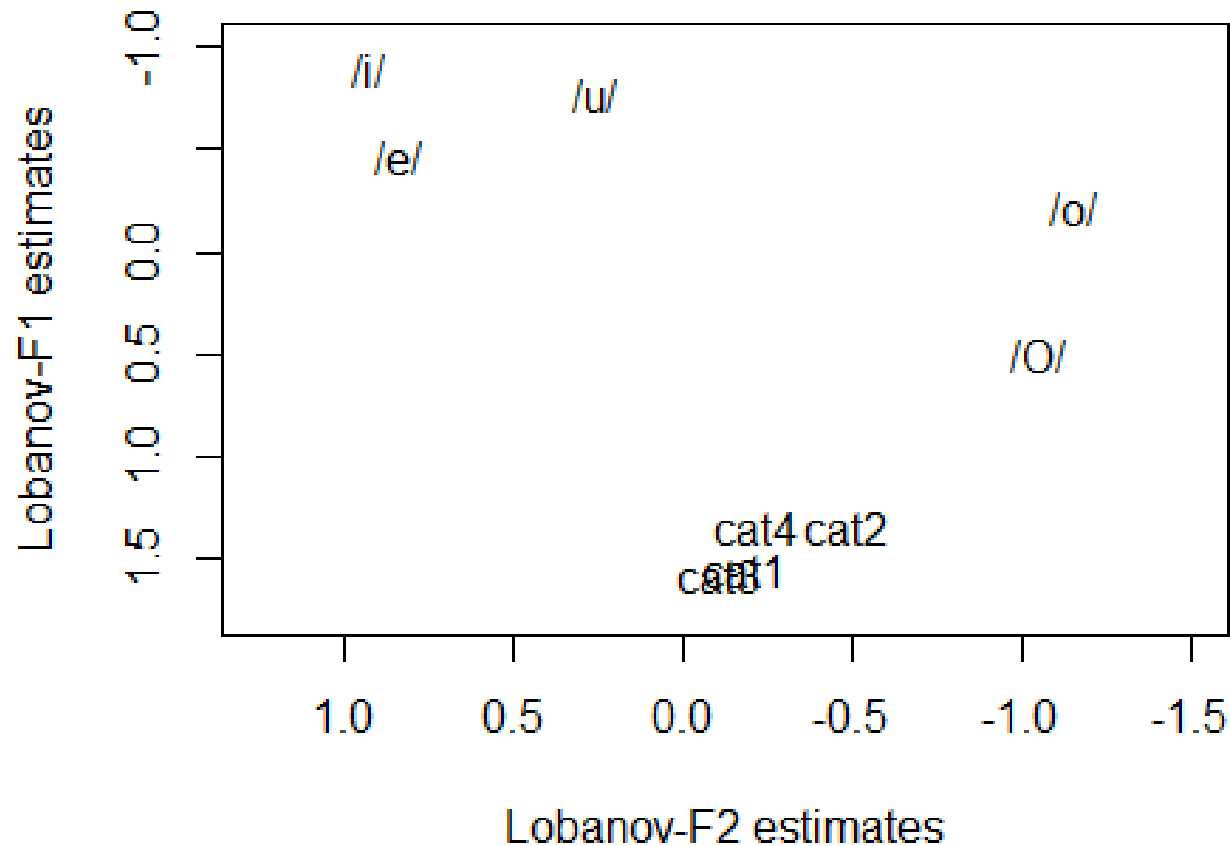
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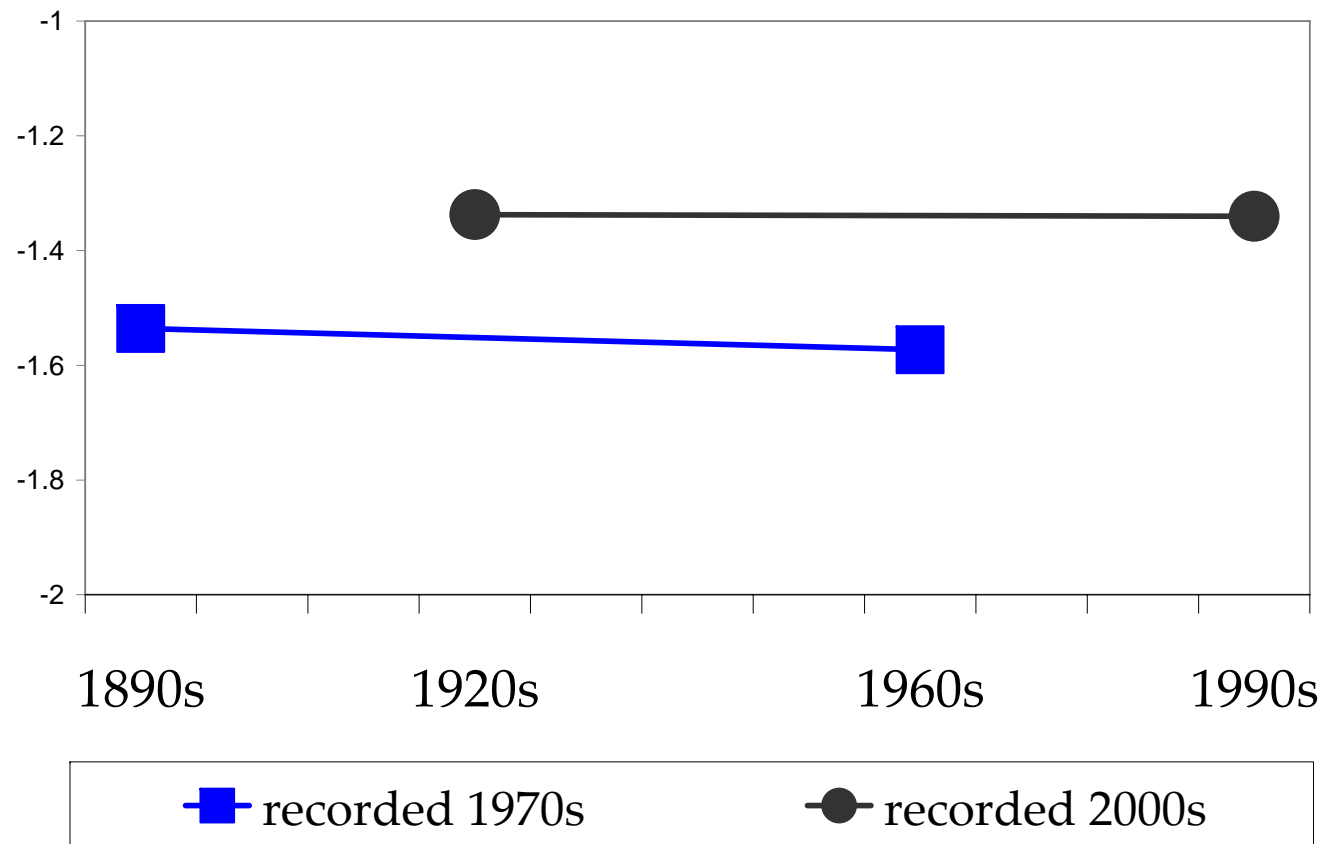
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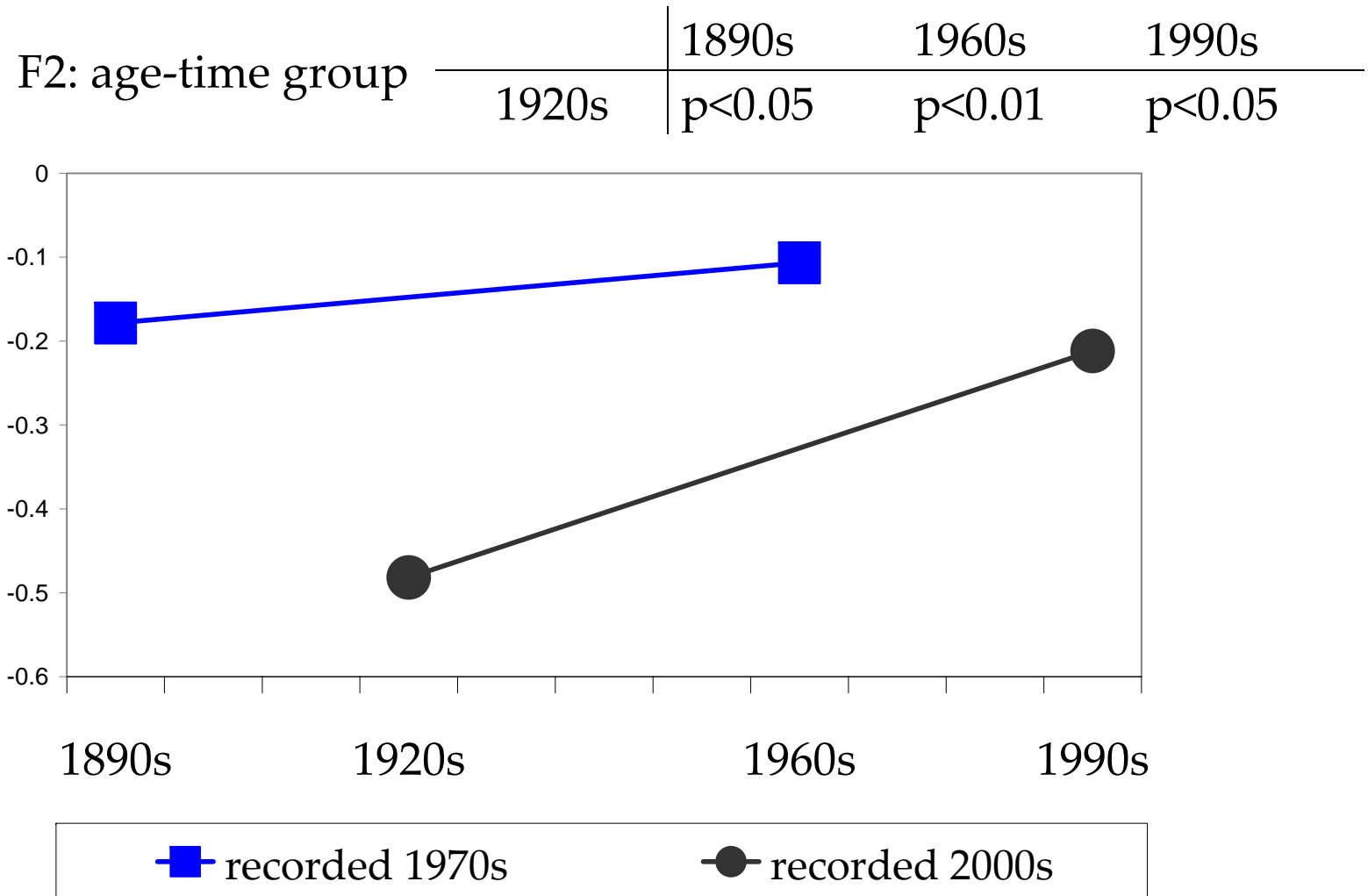
2.8. F1 of CAT modeled in real and apparent time

F1: age-time group = NS



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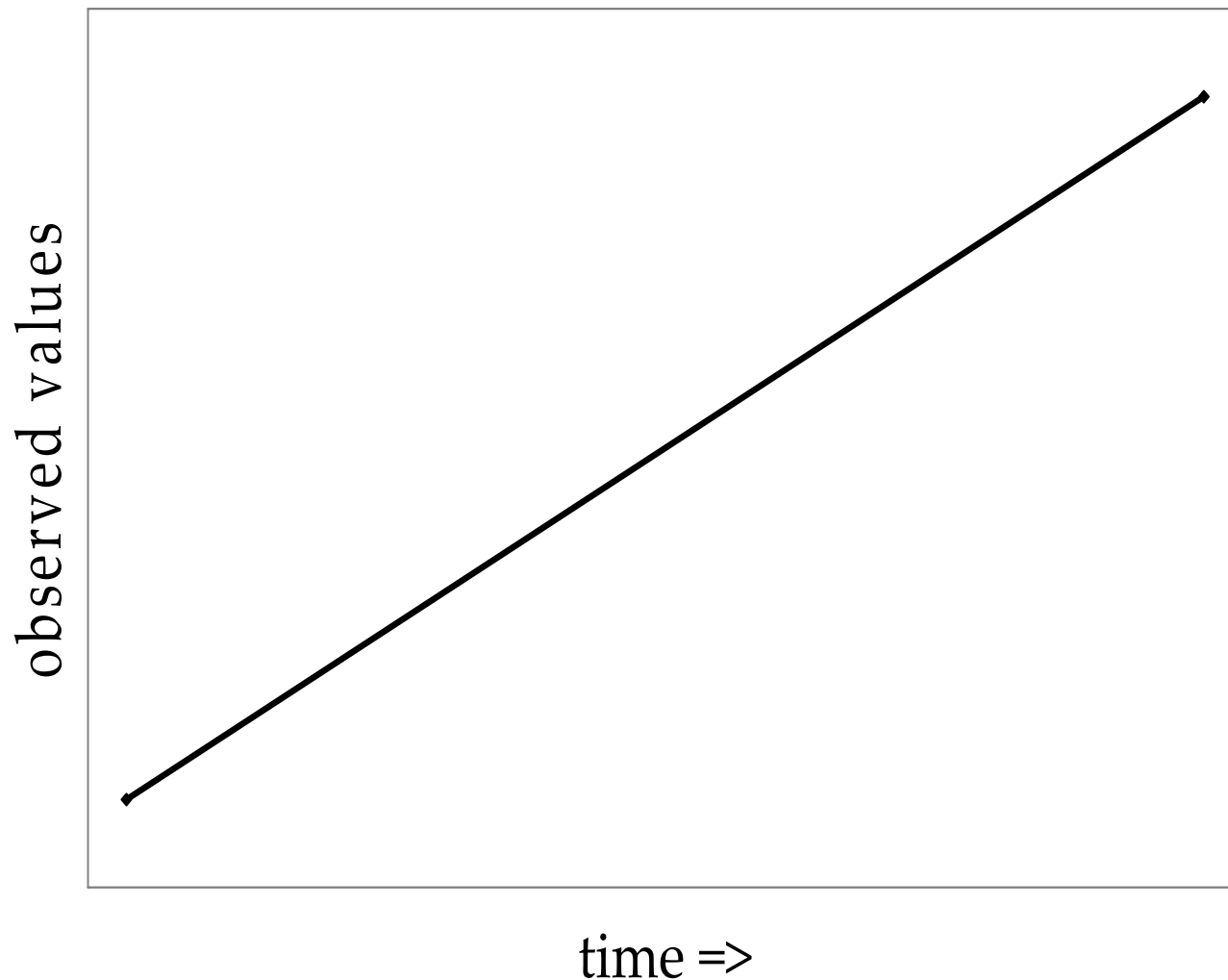
2.8. F2 of CAT modeled in real and apparent time



3. Conclusion(s)

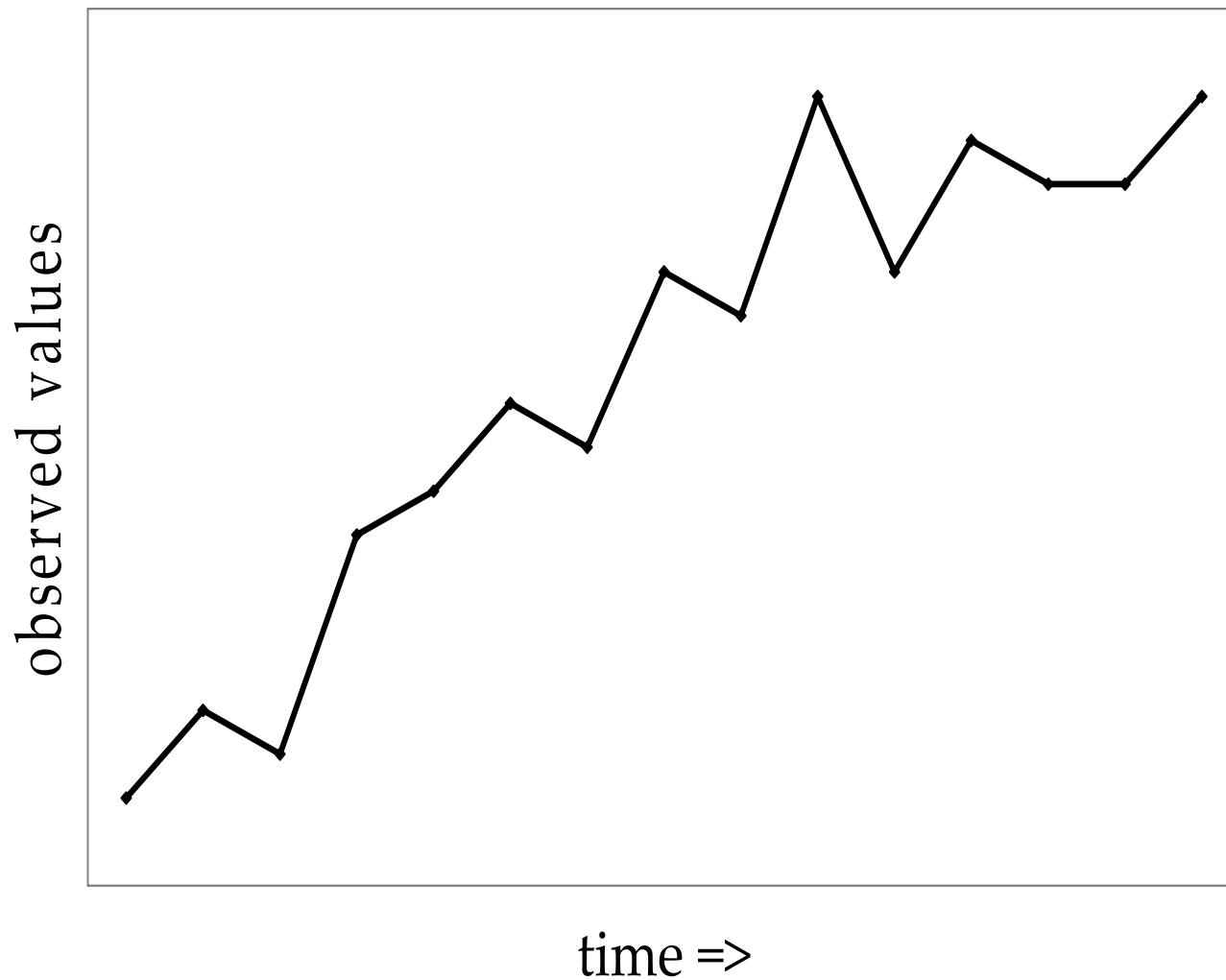
3. Conclusion(s)

3.1. Idealized trajectory of change between Point P and Point Q



3. Conclusion(s)

3.2. More plausible trajectory of change between Point P and Point Q

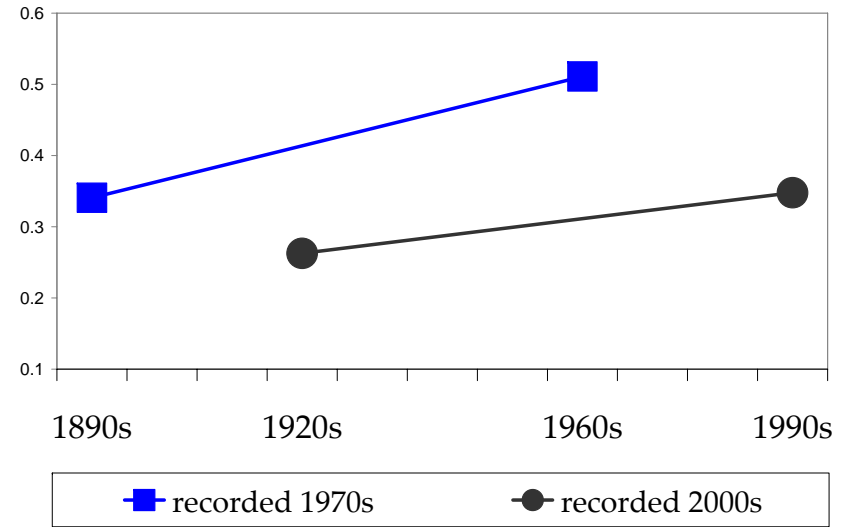
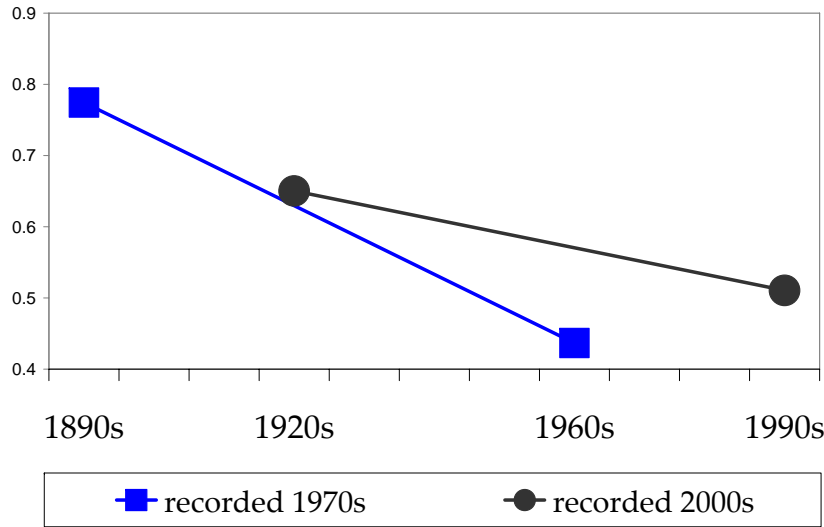


3. Conclusion(s)

3.3. Comparison of observed patterns and theoretical models

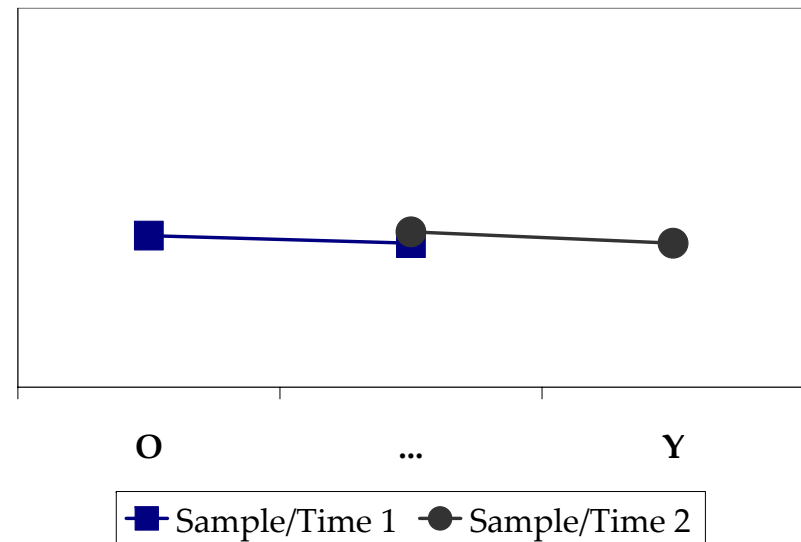
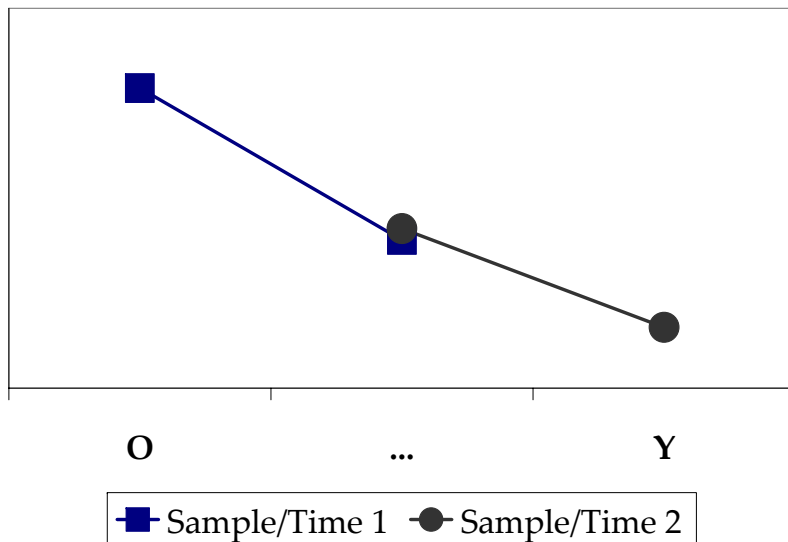
3. Conclusion(s)

3.3. Comparison of observed patterns and theoretical models: BOOT /u/



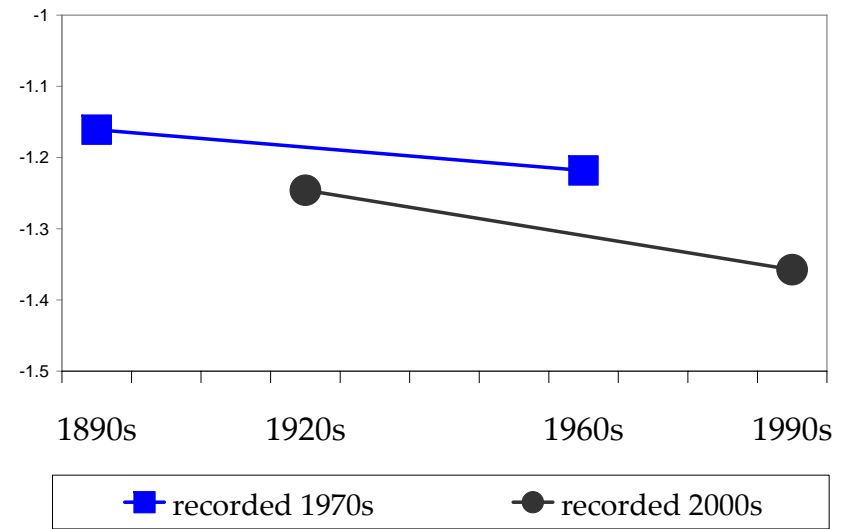
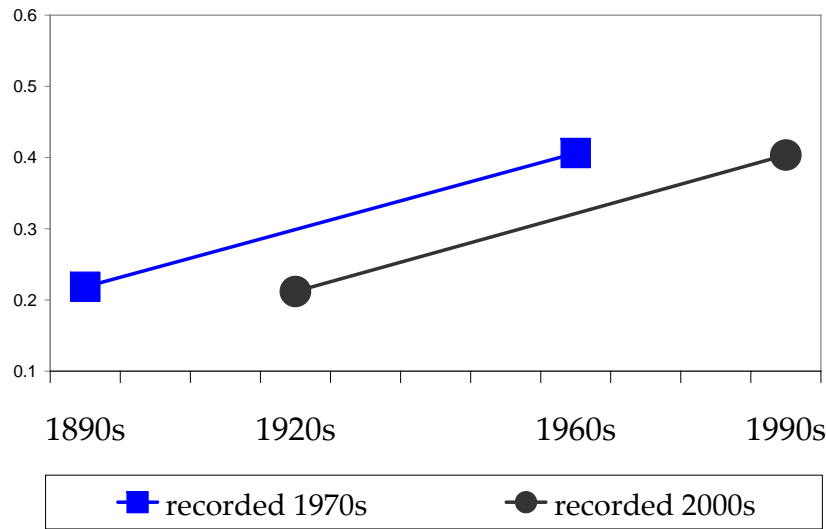
F1/BOOT :: lowering

F2/BOOT :: stability



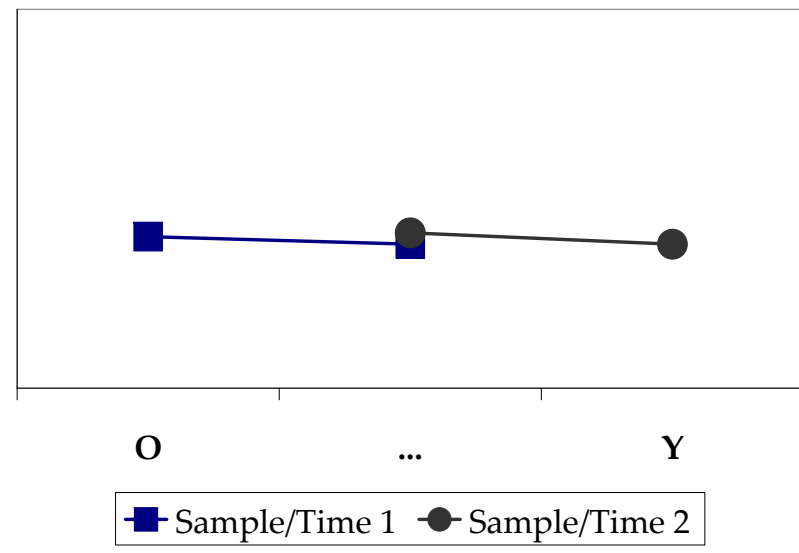
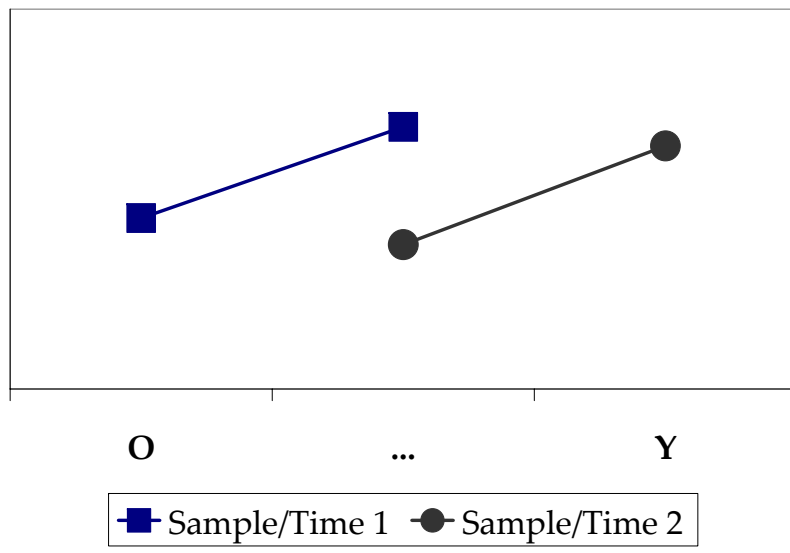
3. Conclusion(s)

3.3. Comparison of observed patterns and theoretical models: GOAT /o/



F1/GOAT :: ((ambiguity))

F2/GOAT :: stability

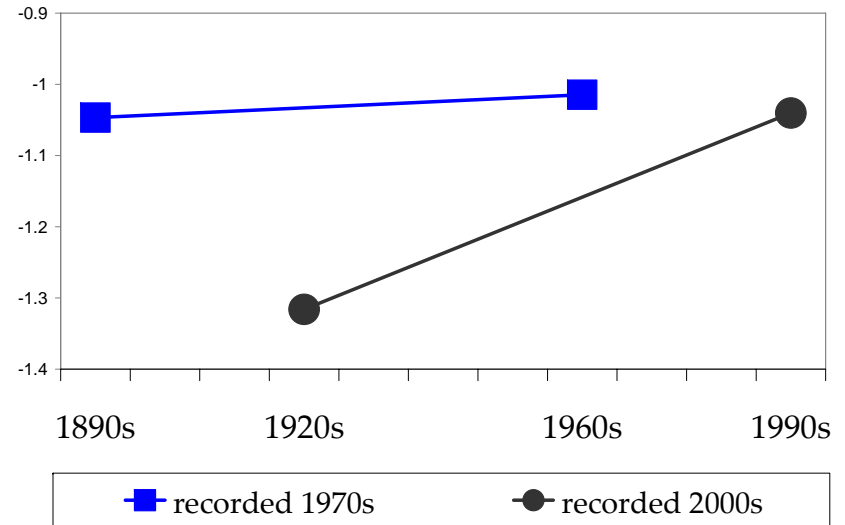
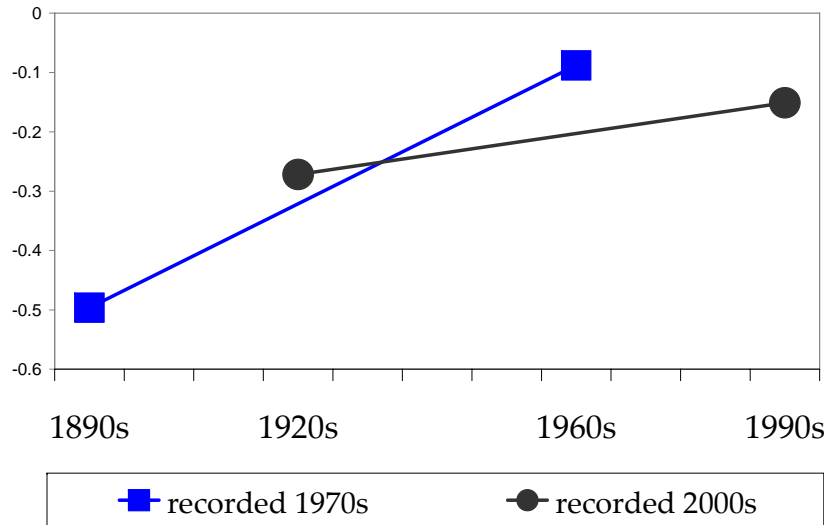


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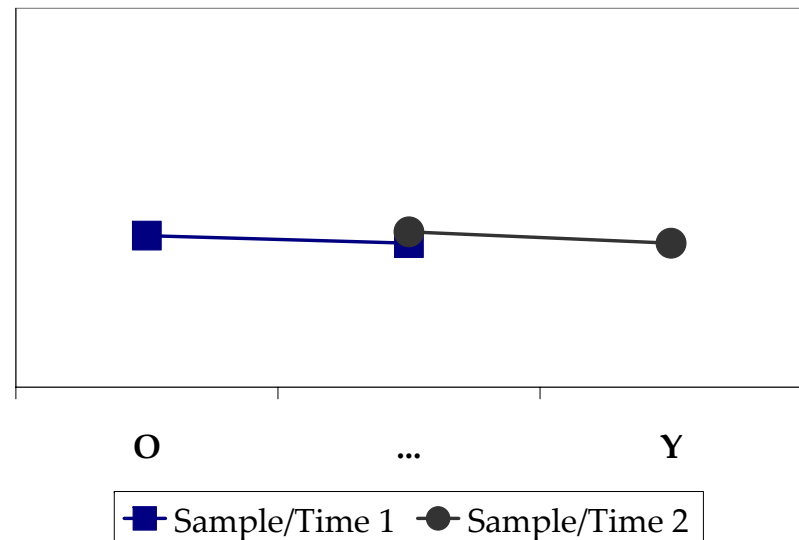
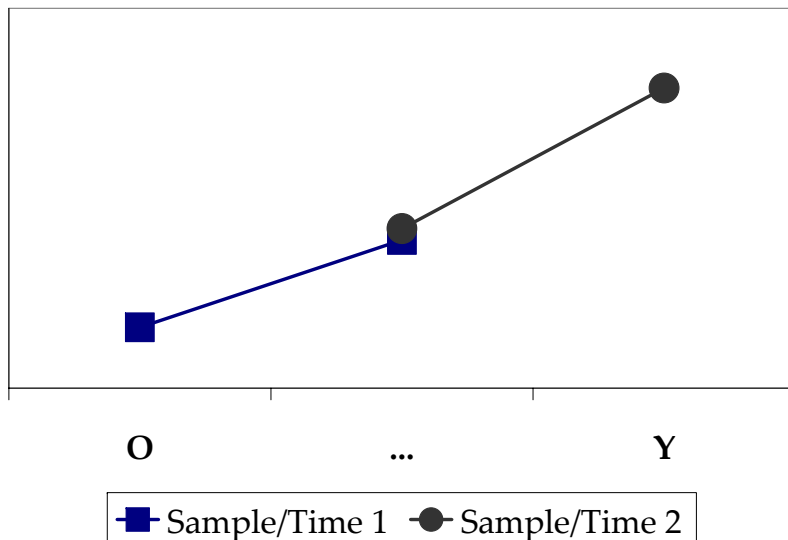
3. Conclusion(s)

3.3. Comparison of observed patterns and theoretical models: LOT /ɔ/



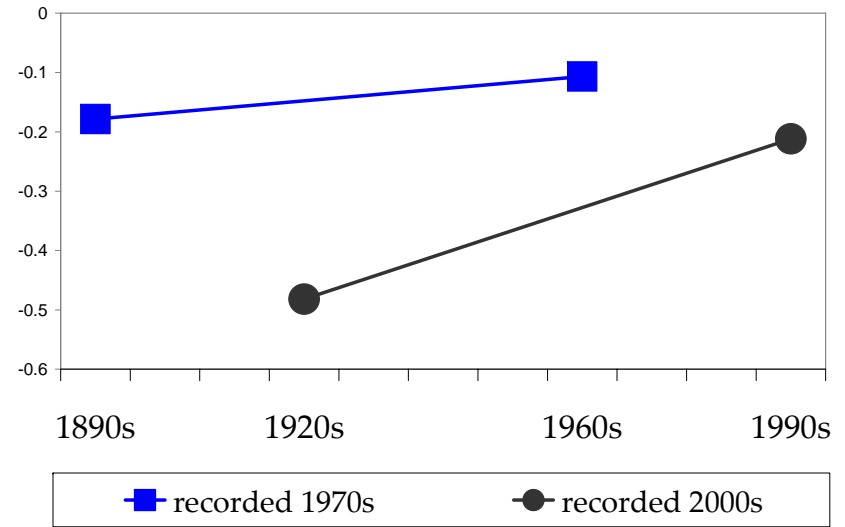
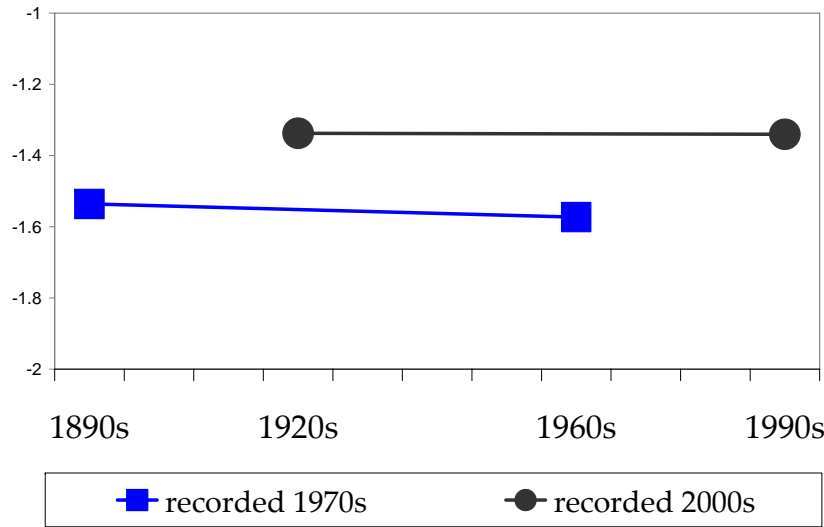
F1/LOT :: raising

F2/LOT :: stability + idiosyncrasy?



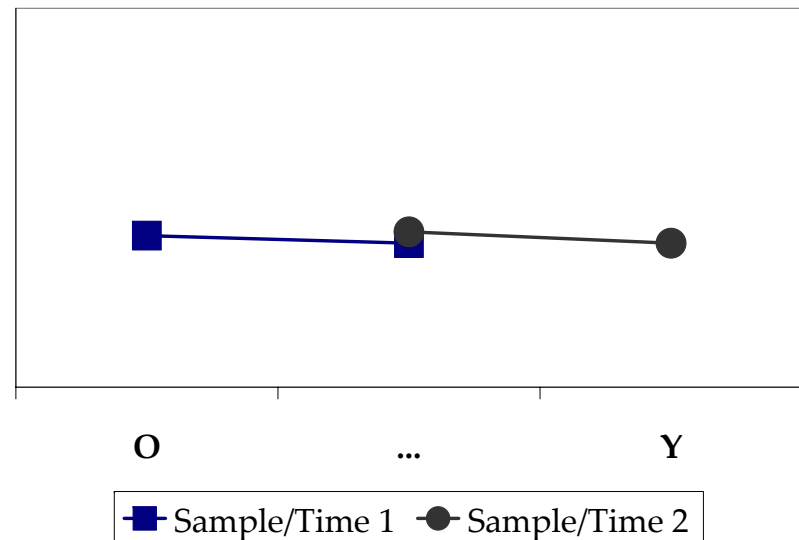
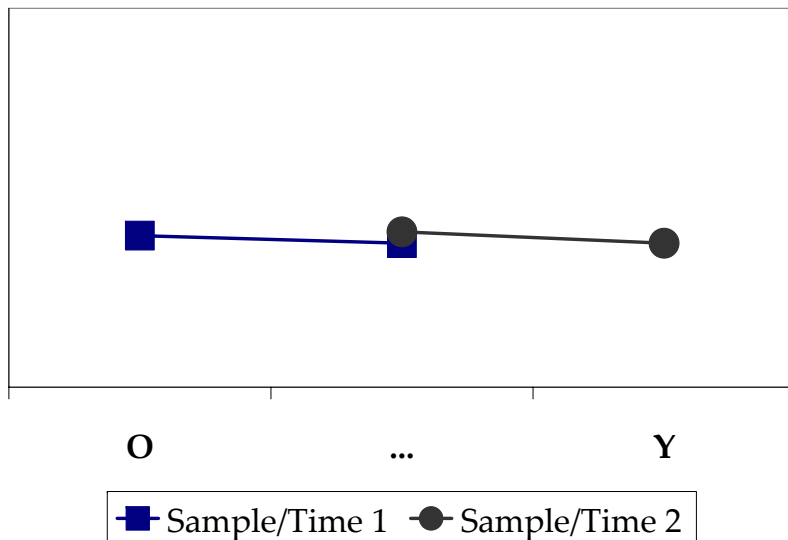
3. Conclusion(s)

3.3. Comparison of observed patterns and theoretical models: CAT /a/



F1/CAT :: stability

F2/CAT :: stability + idiosyncrasy?



3. Conclusion(s)

3.3. Comparison of observed patterns and theoretical models

- The APPARENT-TIME CONSTRUCT assumes grammatical stability.
- This assumption may or may not be correct.
- Regardless, apparent time may be used more or less successfully.
- It seems to have been largely successful in the present case(s).
 - Very simple statistical models
 - A lone fixed factor: *Age-Time*
 - Random factors: *Speaker & Word*
 - Thereby facilitating the real-time assessments
 - Validity of the assessments presumably not compromised

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5. Appendix

5.1. Pairwise comparisons for F1 of BOOT

blue = $p \leq 0.05$

bold blue = $p \leq 0.02$ ($\approx 0.05/3$)

normalized F1	Estimate	Std. Error	t-value	Pr(> t)
Intercept	-0.77452	0.04223	-18.340	<2e-16
1890s vs 1920s	0.12422	0.05094	2.439	0.0227
1890s vs 1960s	0.33777	0.05514	6.125	7.98e-07
1890s vs 1990s	0.26383	0.05336	4.945	3.16e-05
Intercept	-0.65030	0.03708	-17.537	<2e-16
1920s vs 1890s	-0.12422	0.05094	-2.439	0.0227
1920s vs 1960s	0.21354	0.05140	4.154	0.0003
1920s vs 1990s	0.13961	0.04939	2.827	0.0092
Intercept	-0.43676	0.04270	-10.229	4.62e-14
1960s vs 1890s	-0.33777	0.05514	-6.125	7.98e-07
1960s vs 1920s	-0.21354	0.05140	-4.154	0.0003
1960s vs 1990s	-0.07394	0.05342	-1.384	0.1756

5. Appendix

5.2. Pairwise comparisons for F1 of GOAT

blue = $p \leq 0.05$

bold blue = $p \leq 0.02$ ($\approx 0.05/3$)

normalized F1	Estimate	Std. Error	t-value	Pr(> t)
Intercept	-0.21858	0.06029	-3.626	0.0011
1890s vs 1920s	0.00660	0.07887	0.084	0.9339
1890s vs 1960s	-0.18771	0.08054	-2.331	0.0272
1890s vs 1990s	-0.18505	0.08017	-2.308	0.0288
Intercept	-0.21197	0.05319	-3.985	0.0005
1920s vs 1890s	-0.00660	0.07887	-0.084	0.9339
1920s vs 1960s	-0.19432	0.07530	-2.581	0.0161
1920s vs 1990s	-0.19166	0.07492	-2.558	0.0171
Intercept	-0.40630	0.05578	-7.284	4.01e-08
1960s vs 1890s	0.18771	0.08054	2.331	0.0272
1960s vs 1920s	0.19432	0.07530	2.581	0.0161
1960s vs 1990s	0.00266	0.07650	0.035	0.9725

5. Appendix

5.3. Pairwise comparisons for F1 of LOT

blue = $p \leq 0.05$

bold blue = $p \leq 0.02$ ($\approx 0.05/3$)

normalized F1	Estimate	Std. Error	t-value	Pr(> t)
Intercept	0.49628	0.08291	5.986	1.6e-06
1890s vs 1920s	-0.22440	0.11008	-2.039	0.0518
1890s vs 1960s	-0.40827	0.11310	-3.610	0.0012
1890s vs 1990s	-0.34534	0.11190	-3.086	0.0046
Intercept	0.27188	0.07539	3.606	0.0013
1920s vs 1890s	0.22440	0.11008	2.039	0.0518
1920s vs 1960s	-0.18388	0.10758	-1.709	0.0988
1920s vs 1990s	-0.12095	0.10645	-1.136	0.2662
Intercept	0.08800	0.07981	1.103	0.2782
1960s vs 1890s	0.40827	0.11310	3.610	0.0012
1960s vs 1920s	0.18388	0.10758	1.709	0.0988
1960s vs 1990s	0.06293	0.10953	0.575	0.5700

5. Appendix

5.4. Pairwise comparisons for F2 of LOT

blue = $p \leq 0.05$

bold blue = $p \leq 0.02$ ($\approx 0.05/3$)

normalized F2	Estimate	Std. Error	t-value	Pr(> t)
Intercept	-1.04658	0.06828	-15.328	2.22e-16
1890s vs 1920s	-0.26935	0.08452	-3.187	0.0042
1890s vs 1960s	0.03202	0.09003	0.356	0.7247
1890s vs 1990s	0.00633	0.08823	0.072	0.9433
Intercept	-1.31594	0.06048	-21.757	<2e-16
1920s vs 1890s	0.26935	0.08452	3.187	0.0042
1920s vs 1960s	0.30138	0.08394	3.590	0.0014
1920s vs 1990s	0.27569	0.08231	3.349	0.0027
Intercept	-1.01456	0.06807	-14.905	<2e-16
1960s vs 1890s	-0.03203	0.09003	-0.356	0.7247
1960s vs 1920s	-0.30138	0.08394	-3.590	0.0014
1960s vs 1990s	-0.02569	0.08787	-0.292	0.7720

5. Appendix

5.5. Pairwise comparisons for F2 of CAT

blue = $p \leq 0.05$

bold blue = $p \leq 0.02$ ($\approx 0.05/3$)

normalized F2	Estimate	Std. Error	t-value	Pr(> t)
Intercept	-0.17836	0.09657	-1.847	0.0748
1890s vs 1920s	-0.30336	0.12911	-2.350	0.0264
1890s vs 1960s	0.07172	0.13194	0.544	0.5909
1890s vs 1990s	-0.03340	0.13005	-0.257	0.7992
Intercept	-0.48172	0.08878	-5.426	9e-06
1920s vs 1890s	0.30336	0.12911	2.350	0.0264
1920s vs 1960s	0.37507	0.12639	2.968	0.0061
1920s vs 1990s	0.26996	0.12439	2.170	0.0391
Intercept	-0.10664	0.09269	-1.151	0.2583
1960s vs 1890s	-0.07172	0.13194	-0.544	0.5909
1960s vs 1920s	-0.37507	0.12639	-2.968	0.0061
1960s vs 1990s	-0.10512	0.12712	-0.827	0.4151

