Keeping up with the neighbours

An agent-based simulation of the divergence of the standard Dutch pronunciations in the Netherlands and Belgium

Anthe Sevenants, Dirk Speelman

Divergence?

Divergence?

🇳🇱 Dutch ⟷ 🇧🇪 Dutch

Divergence?

- beginning of 20th century

- status, prestige
- anti-French

Divergence?

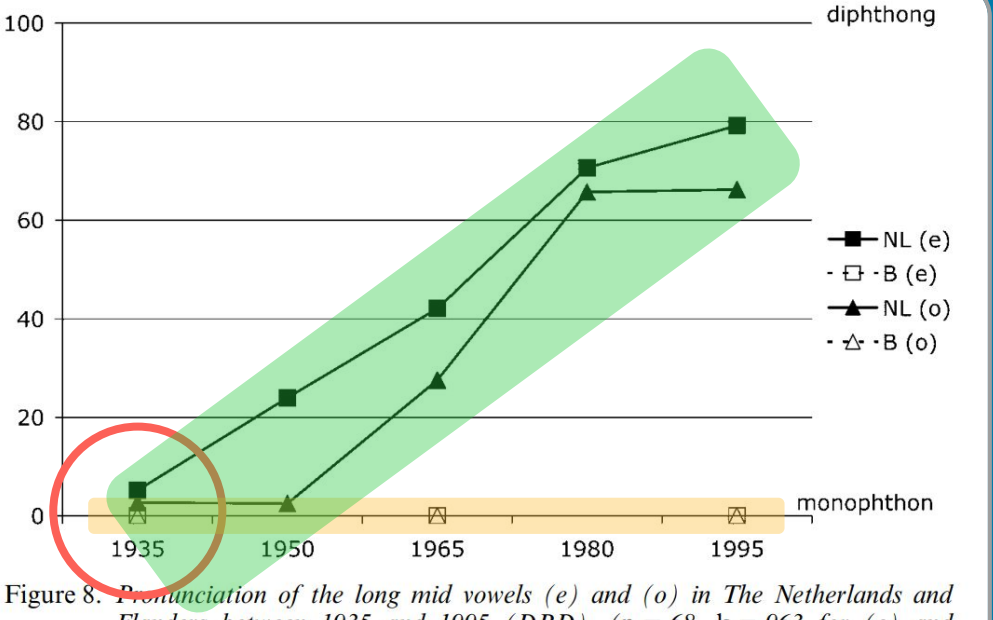


Figure 8. *Pronunciation of the long mid vowels (e) and (o) in The Netherlands and Flanders between 1935 and 1995 (DRD).* (n = 68, k = 963 *for (e) and* k = 919 *for (o)).*

(Van de Velde et al. 2010)

Why?

Why?

- four different theories

1 Is it plausible that reduced contact between speakers from the Netherlands and Belgium resulted in a divergence between the standard pronunciations in both countries?

Why?

- four different theories

2 Is it possible that an increased pace of language change in Dutch speakers caused a divergence between the standard pronunciations of the Netherlands and Belgium?

Why?

- four different theories

3 Can we relate increased ethnocentrism in Belgian speakers to less adoption of Netherlandic innovations or even divergence?

Why?

- four different theories

lack of contact

1

moving target

2

ethnocentrism

3

media influence

4

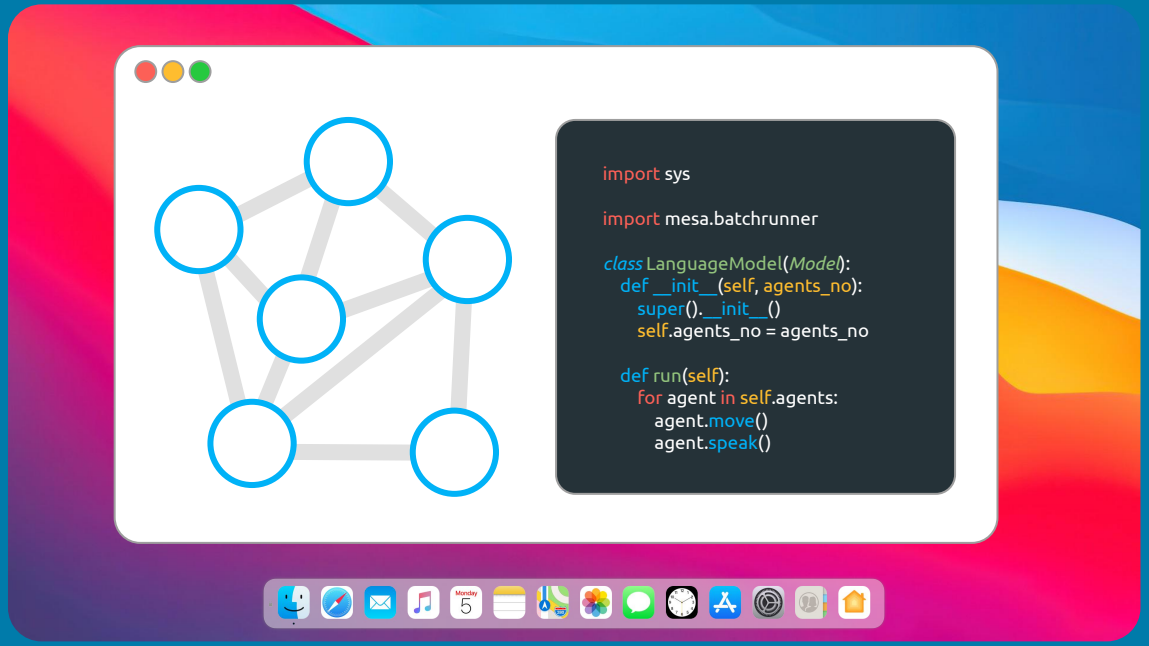
4 Is it likely that increased media influence amplified the existing tendencies for language change (acceleration or inhibition) in Belgium?

Bogus?

Simulations!

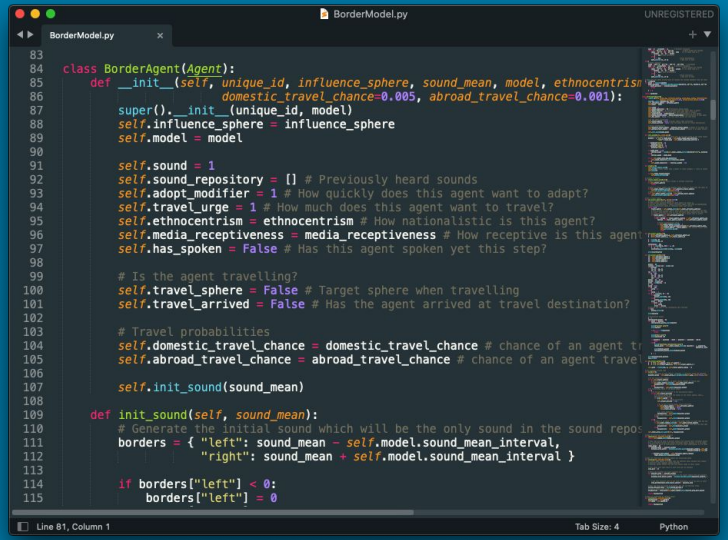
Simulations

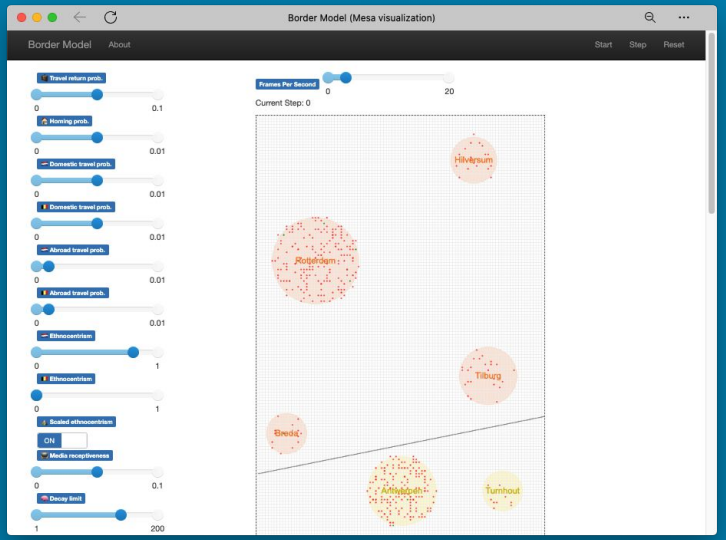
- plausibility in a synthetic environment
- virtual speakers (‘agents’)
- local behaviour
  ↓
  system behaviour
- plausibility **only**



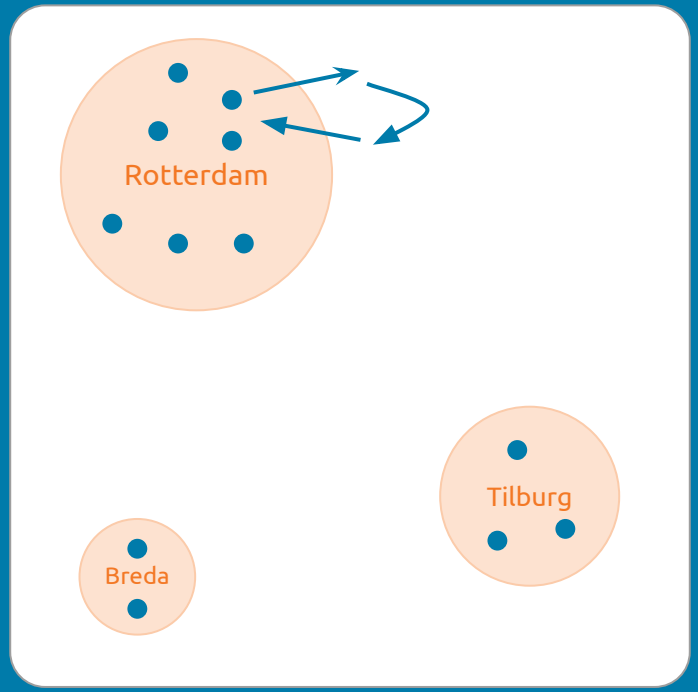
Model design: architecture

- Python, using MESA
- model + visualisation

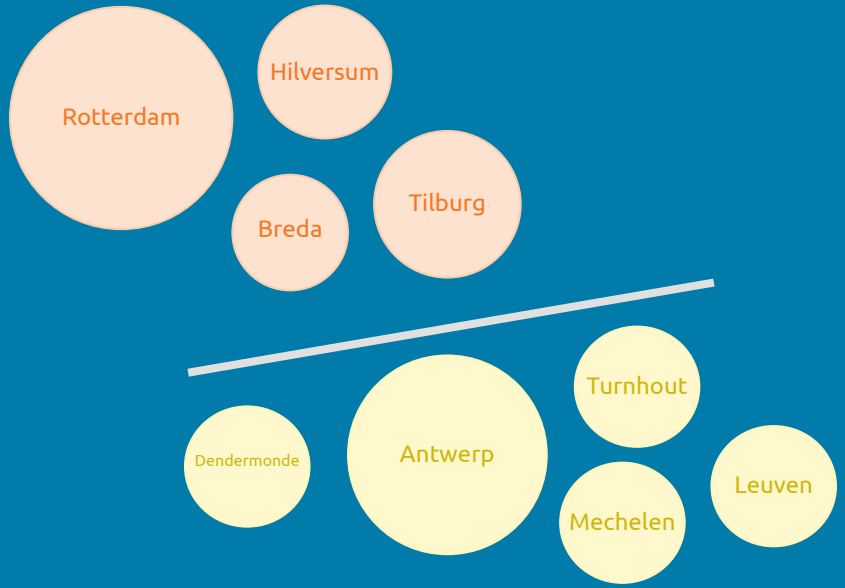




Model design: space

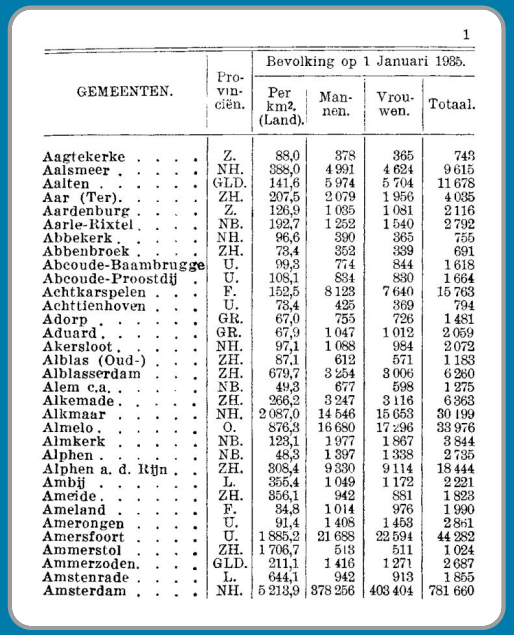


- influence spheres
- based on **Stanford & Kenny (2013)**
- cities:



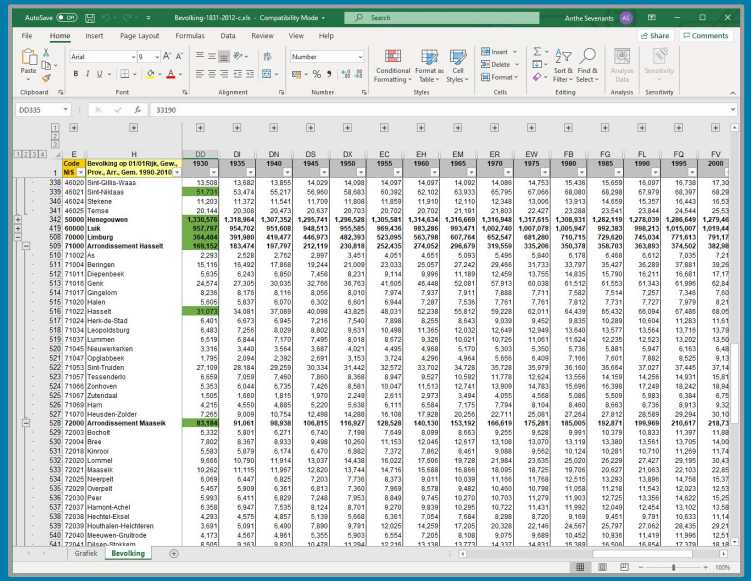
Model design: populations

- populations based on historical data → 1/3000
- Centraal Bureau voor de Statistiek / Jan Hertogen



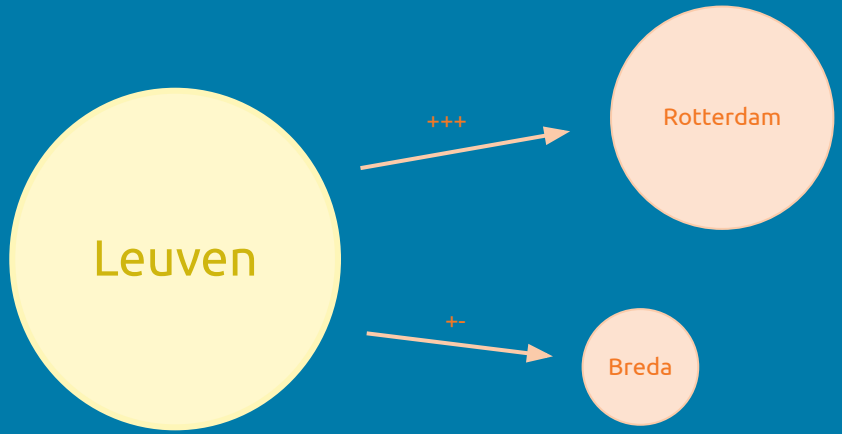
1

GEMEENTEN.	Pro-vin-ciën.	Bevolking op 1 Januari 1935. Per km². (Land).	Man-nen.	Vrou-wen.	Totaal.
Aagtekerke	Z.	88,0	378	365	743
Aalsmeer	NH.	388,0	4 991	4 624	9 615
Aalten	GLD.	141,6	5 974	5 704	11 678
Aar (Ter)	ZH.	207,5	2 079	1 956	4 035
Aardenburg	Z.	126,9	1 035	1 081	2 116
Aarle-Rixtel	NB.	192,7	1 252	1 540	2 792
Abbekerk	NH.	96,6	390	365	755
Abbenbroek	ZH.	73,4	352	339	691
Abcoude-Baambrugge	U.	99,3	774	844	1 618
Abcoude-Proostdij	U.	108,1	894	830	1 664
Achtkarspelen	F.	152,5	8 123	7 640	15 763
Achttienhoven	U.	73,4	425	369	794
Adorp	GR.	67,0	755	726	1 481
Aduard	GR.	67,9	1 047	1 012	2 059
Akersloot	NH.	97,1	1 088	984	2 072
Alblas (Oud-)	ZH.	87,1	612	571	1 183
Alblasserdam	ZH.	679,7	3 254	3 006	6 260
Alem c.a.	NB.	49,3	677	598	1 275
Alkemade	ZH.	266,2	3 247	3 116	6 363
Alkmaar	NH.	2 087,0	14 546	15 653	30 199
Almelo	O.	876,3	16 680	17 296	33 976
Almkerk	NB.	123,1	1 977	1 867	3 844
Alphen	NB.	48,3	1 397	1 338	2 735
Alphen a. d. Rijn	ZH.	308,4	9 330	9 114	18 444
Ambij	L.	355,4	1 049	1 172	2 221
Ameide	ZH.	356,1	942	881	1 823
Ameland	F.	34,8	1 014	976	1 990
Amerongen	U.	91,4	1 408	1 453	2 861
Amersfoort	U.	1 885,2	21 688	22 594	44 282
Ammerstol	ZH.	1 706,7	513	511	1 024
Ammerzoden	GLD.	211,1	1 416	1 271	2 687
Amstenrade	L.	644,1	942	913	1 855
Amsterdam	NH.	5 213,9	378 256	403 404	781 660



Model design: travel

- agents can travel to other spheres
- gravity model (Trudgill 1974)



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Linguistic change and diffusion: description and explanation in sociolinguistic dialect geography

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ABSTRACT

Linguistic geography has remained relatively unaffected by recent developments in sociolinguistic theory and method and theoretical geography. In this paper it is argued that insights and techniques from both these disciplines will be of value in improving descriptions of geographical variation in language, and that these improvements will in turn lead to more adequate explanations for certain of the social and spatial characteristics of linguistic change. Evidence in favour of a sociolinguistic methodology and new cartographic techniques in dialect geography is drawn from empirical studies in urban dialectology, in East Anglia, England, and rural dialectology, in Norway. (Sociolinguistic variation, dialectology, linguistic change, British English, Norwegian.)

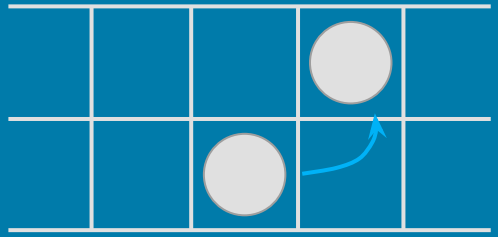
William Labov's *Social Stratification of English in New York City* has made a number of very important contributions to linguistic theory and practice.[1] Among these are the development of the concept of the linguistic variable, which has provided linguists with a means of measuring and describing gradient and variable linguistic features, and the adoption of certain aspects of sociological methodology (particularly sampling and social class index construction), which has permitted a detailed study of the covariation of linguistic and social phenomena. This in turn has enabled us to achieve a clearer understanding of the nature of the relationship between language and various sociological parameters, and increased our knowledge about the social setting of linguistic change. In this paper I want to argue that the linguistic variable, together with a number of methodological and theoretical insights from human geography, can similarly improve our knowledge of the relationship between language and geography, and of the geographical setting of linguistic change.

In section 1 I shall suggest some reasons for considering the improvement of

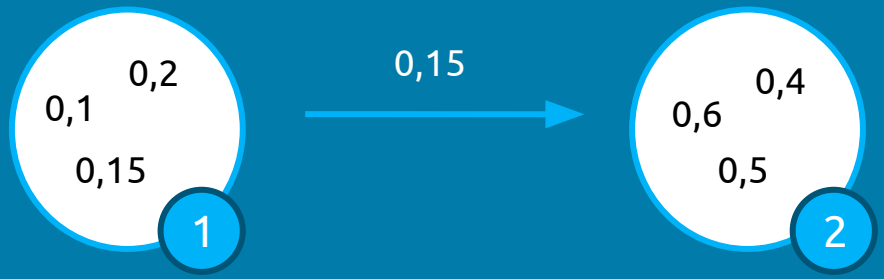
[1] I am very grateful indeed to R. L. Hodgart, who first interested me in the topic of this paper, and to Arne Kjell Foldvik, who first involved me in the study of Norwegian, and without whom the Brunlanes survey would have been impossible. I am also grateful to the large number of people who commented on earlier versions of this paper, especially E. Afendras, C. J. Bailey, D. Bickerton, R. W. Fasold, A. K. Foldvik, W. N. Francis, T. Hägerstrand, P. Haggett, B. Jernudd, W. Labov, A. McIntosh, F. R. Palmer, S. T. Trudgill and J. C. Wells. My thanks are also due to Ingeborg Hoff for her help with aspects of the Norwegian data.

Model design: speaking

- adjacent / occupying same cell = talk



  - exemplar exchange



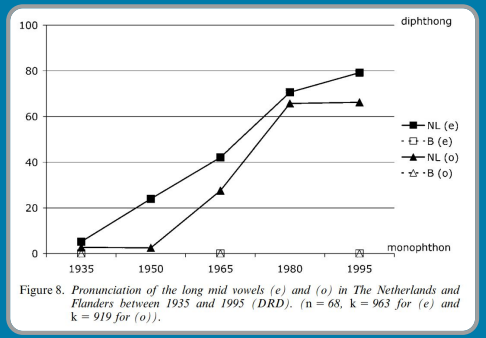
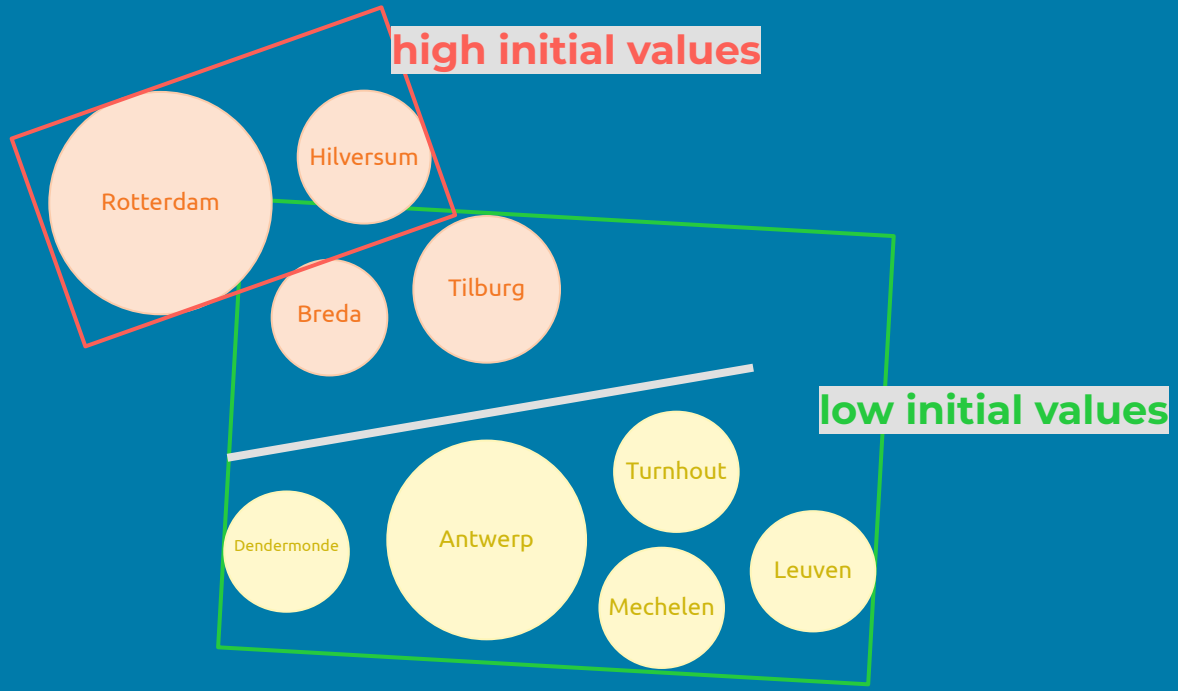


Figure 8. *Pronunciation of the long mid vowels (e) and (o) in The Netherlands and Flanders between 1935 and 1995 (DRD). (n = 68, k = 963 for (e) and k = 919 for (o)).*

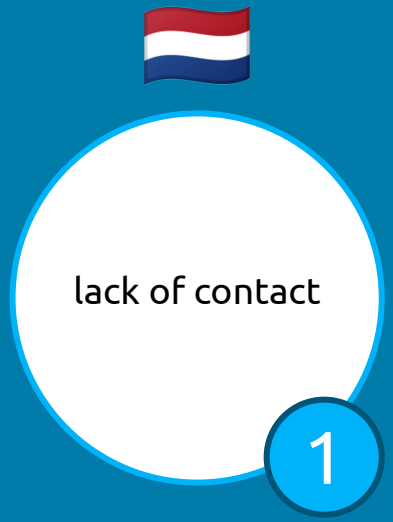
- exemplar = value between 0 and 1
  - diphthongisation, voicelessness of fricatives…

Model design: speaking



unrealistic?

Model design: testing the theories



- systematic reduction of abroad travel rate
- Belgian and Dutch agents will come across each other less

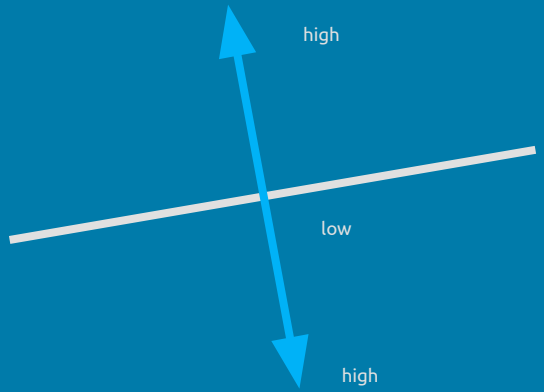
Model design: testing the theories

- increase of number of exemplars
- hearer saves sound ~~once~~ more than once
  - faster evolution
- difficult to influence the system → local changes

Model design: testing the theories

- higher ethnocentrism = lower chance of adoption
- systematically altered for entire BE population
  - NL: always have high values
- alternative scaled implementation
  - ethnocentrism ~ distance from border

(NOS Afdeling kijk- en luisteronderzoek and BRT Studiedienst 1983, 13)

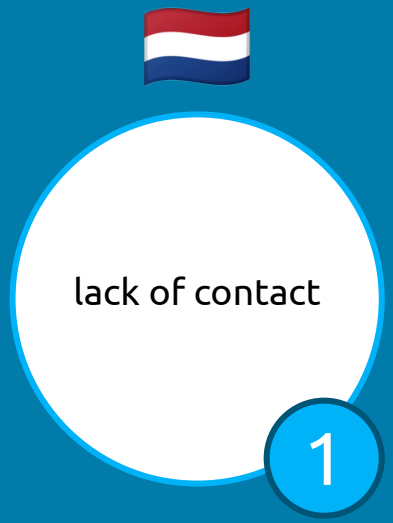


Model design: testing the theories

- media influence
- Dutch agents: sounds from *Randstad area*
- Belgian agents: sounds from *Brabant* (¾) + *Randstad area* (¼)
  (Instituut der Nederlandse Uitzendingen 1982, 15)
- individually defined, since receptiveness for media innovations seem to be person-bound
  (Stuart-Smith & Timmins, 2009)
- sound saved? ~ media receptiveness
  - varied across entire population

What effect do the alternations have on the sound evolution in Belgium?

Results



- lack of contact can lead to divergence
- abroad travel rate = $\frac{\text{domestic travel rate}}{5000}$
- not unrealistic

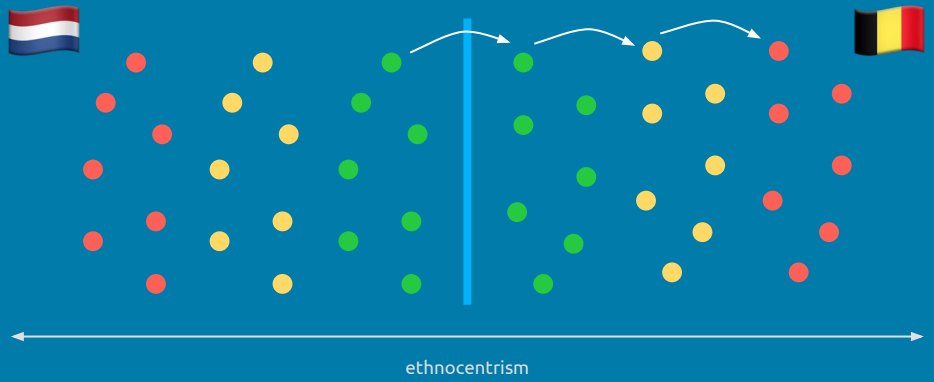
(NOS Afdeling kijk- en luisteronderzoek and BRT Studiedienst 1983, 21, 48)

Results

- pace of sound shift in NL did not seem to have an influence on Belgian sound evolution
- hard to model: exasperation
- pace alone is not enough

Results

- higher BE ethnocentrism = less NL adoption
- divergence possible after BE contact with NL was reduced
- scaled ethnocentrism = little effect on divergence → positive gatekeeping?



Results

- any media influence always causes convergence for BE
- media theory plausible in convergence situations

Questions?

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