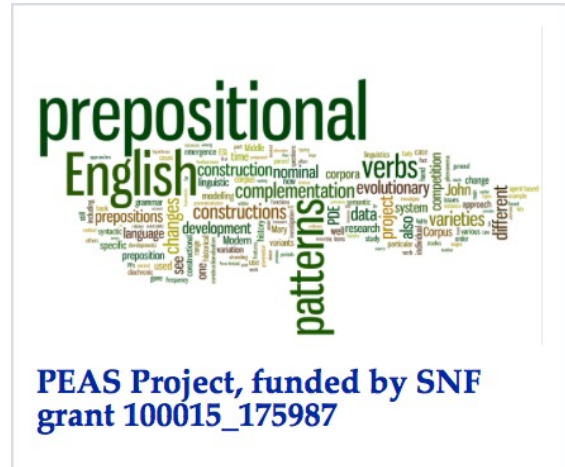# Approaching Epicentral Influence with Agent-Based Modelling

Marianne Hundt, Laetitia van Driessche and Dirk Pijpops

Workshop on

Rescoping the theory and methodology of linguistic epicenters in World Englishes

PEAS Project, funded by SNF grant 100015_175987

Motivation

- Corpus-based research provides evidence on convergence (or divergence)

- Usage-based evidence on epicentre influence requires diachronic data

- Corpus data only do not give us the whole picture (lack of information on attitudes, see Hundt 2013)

- Use complementary approach – Agent-Based Modelling (ABM): simulation of variation to predict variation *should* attitudes play an important role for epicentral influence
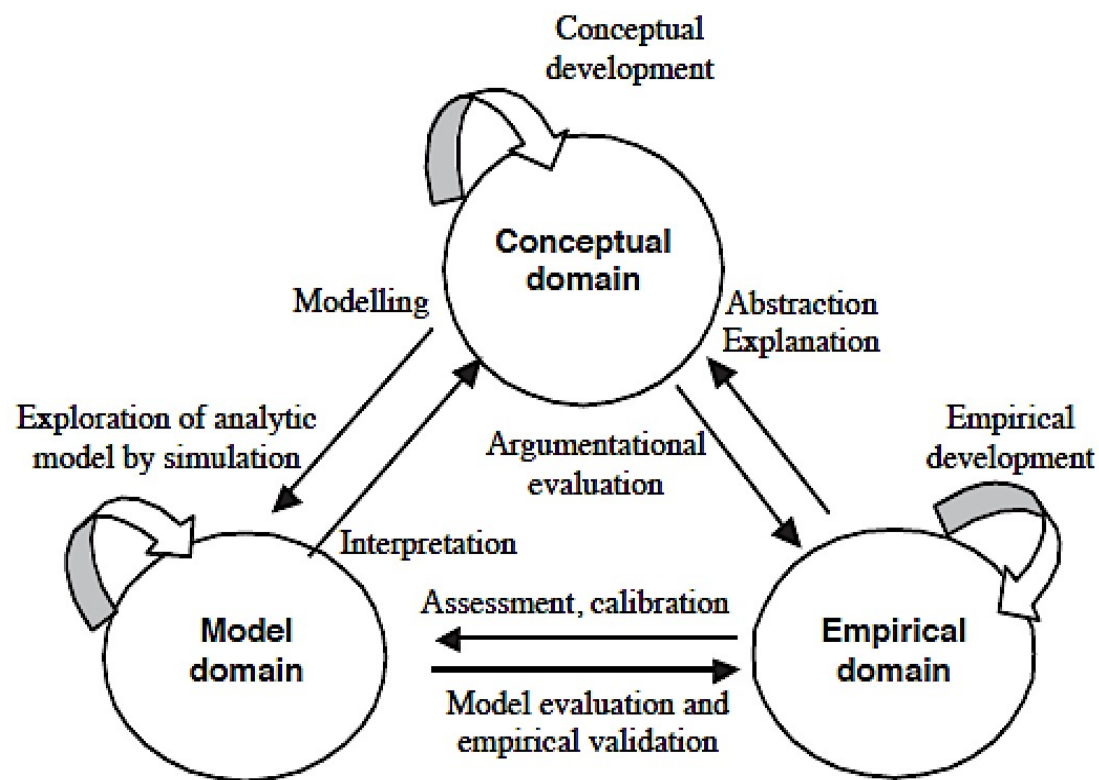
Objectives

- Case study on verb complementation in two metropolitan varieties and two ESL

- Build agent-based model to gauge potential effect of attitudes vs. dialect contact

- Compare results of ABM with corpus data

- Feed results into theory on modelling epicentre in World Englishes

Caveat

ABM does not aim at modelling the actual complexities of language users/speakers' choices (e.g. by including historical, cultural, individual factors)

ABM adhere's to Occam's Razor: aim is to build a model that is as simple as possible while still simulating the mechanisms under scrutiny (Landsbergen, 2009: 18-19; van Trijp & Steels, 2012: 9)

ABM – corpus data – theory

Conceptual development

Conceptual domain

Modelling   Abstraction Explanation

Exploration of analytic model by simulation   Empirical development

Argumentational evaluation

Interpretation

Model domain   Assessment, calibration   Empirical domain

Model evaluation and empirical validation

Fig 1. Relating simulation to theory and data
(from Livet et al., 2014)

Case study: ASCs with *protest* and *appeal*

Fig. 2. Complementation of *protest* in Newspaper databases
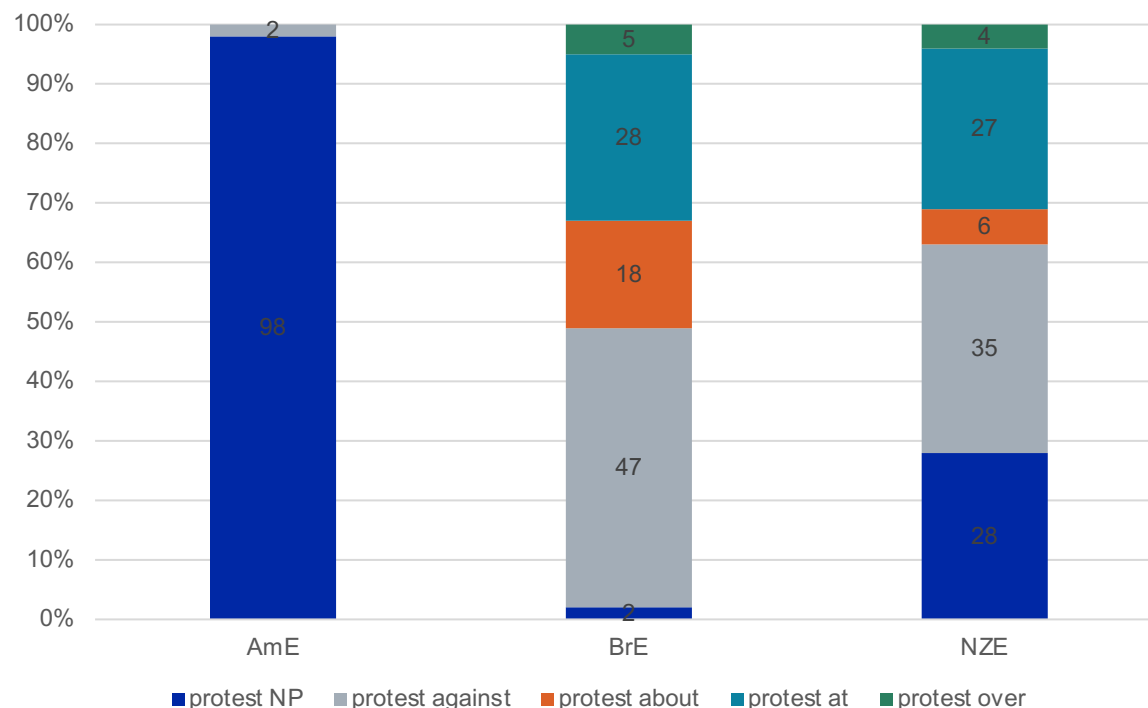
(based on Hundt 1998; N = 100 per variety from the *Miami Herald* (US), the *Guardian* (GB) and the *Dominion/Evening* Post (NZ), respectively)

ESL varieties and the dynamics of WEs

Indian English (IndE) – with BrE as matrilect/traditional exonormative model

Philippine English (PhilE) – with AmE as matrilect/traditional exonormative model

- Acquisition of English as second language (education, online media)

- AmE at the top of the hierarchy (Mair 2013)

- Individual speakers differ in their attitude towards the historical matrilect / AmE

Attitudes and ASCs

"It is often claimed that American English uses more words than are strictly necessary … . However, it is interesting that complaints are just as common when an American innovation is in fact more concise, more economical than the traditional British form, as in *to protest* or *to appeal*, as opposed to *to protest against* or *to appeal against.* … This inconsistency suggests that hostility to American usages may have less to do with the linguistic forms themselves than with a rather deeper dislike of the society and culture from which these forms derive."

Gordon & Deverson (1989: 75f.)

Research questions

- Do attitudes towards the matrilects play a role in epicentre influence (shift from BrE to AmE ASC)?

  - Assumption that PhilE speakers are more conservative than AmE speakers in their ASCs (shift occurred in the second half of the twentieth century)
  - PP complements are structurally more explicit and therefore generally favoured by ESL speakers.

- Does lexical variation play a role in epicentral influence?

  - Does frequency have an influence on epicentral influence?

  - Does paradigmatic variation in the ASCs have an influence?

Components of the model

– regional differences in the ASCs of *protest* and *appeal* (AmE prefers bare NP complement, BrE prefers PP complement, see Hundt 1998, Rohdenburg 2009);

– IndE and PhilE have different matrilects, i.e. speakers start off from different usage preferences related to (but not identical with) their matrilects;

– speakers are aware of the regional differences between BrE and AmE in the complementation of the two verbs and speakers in the ESL communities differ with respect to their attitudes towards AmE (some speakers are pro-Am, some are con-Am, some are neutral);

– speakers are exposed to BrE and AmE variants through media (news on the web); we take the differences in size of the two regional sub-corpora in NOW as suggestive, i.e. ESL readers are twice as likely to encounter rthe AmE than the BrE ASC.

Three different models

Condition 1: There is no ongoing language change and the input from the matrilects is stable.

Condition 2: Speakers in the two communities differ in their reading preferences in that con-Am speakers actively avoid American sources and thus get lower Am input.

Condition 3: In addition to the parameters under condition 2, there is ongoing language change such that BrE is slowly shifting towards AmE complementation patterns for *protest* and *appeal;* this is the 'global Americanisation' condition.

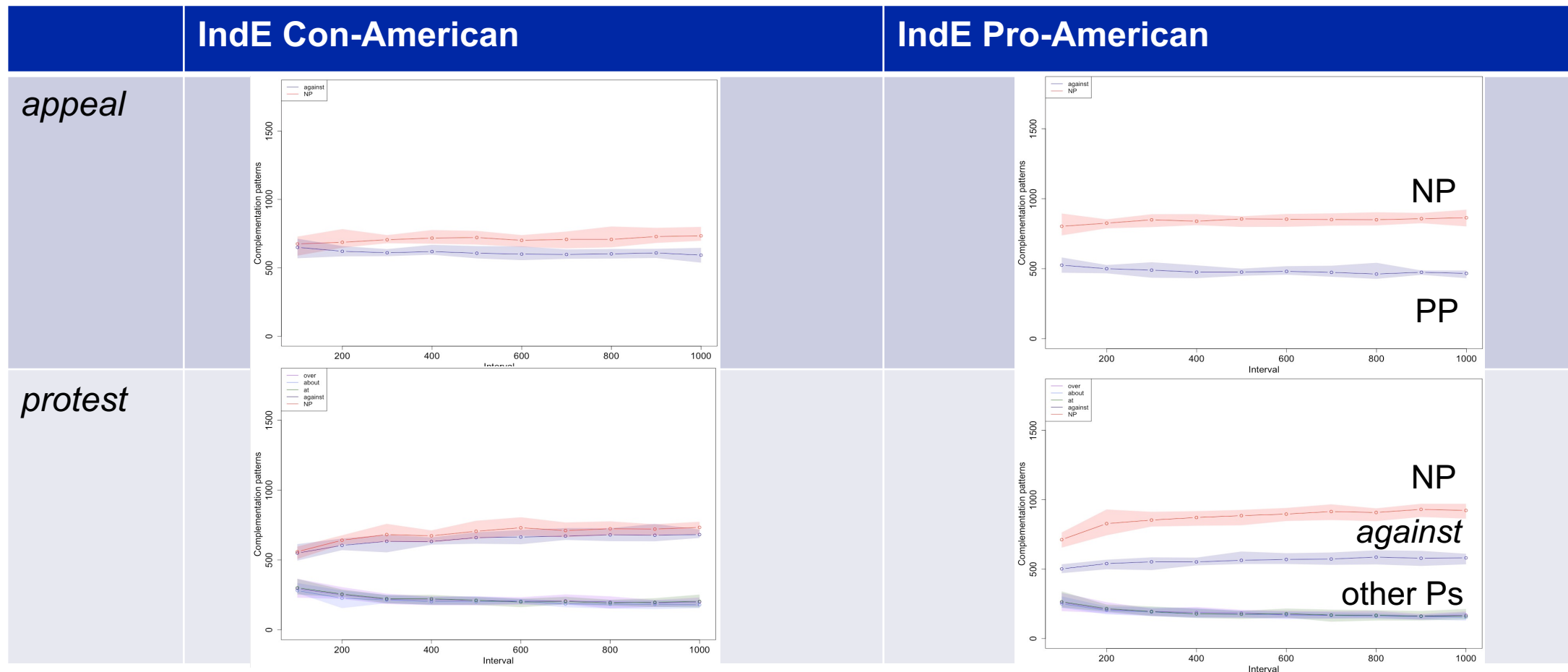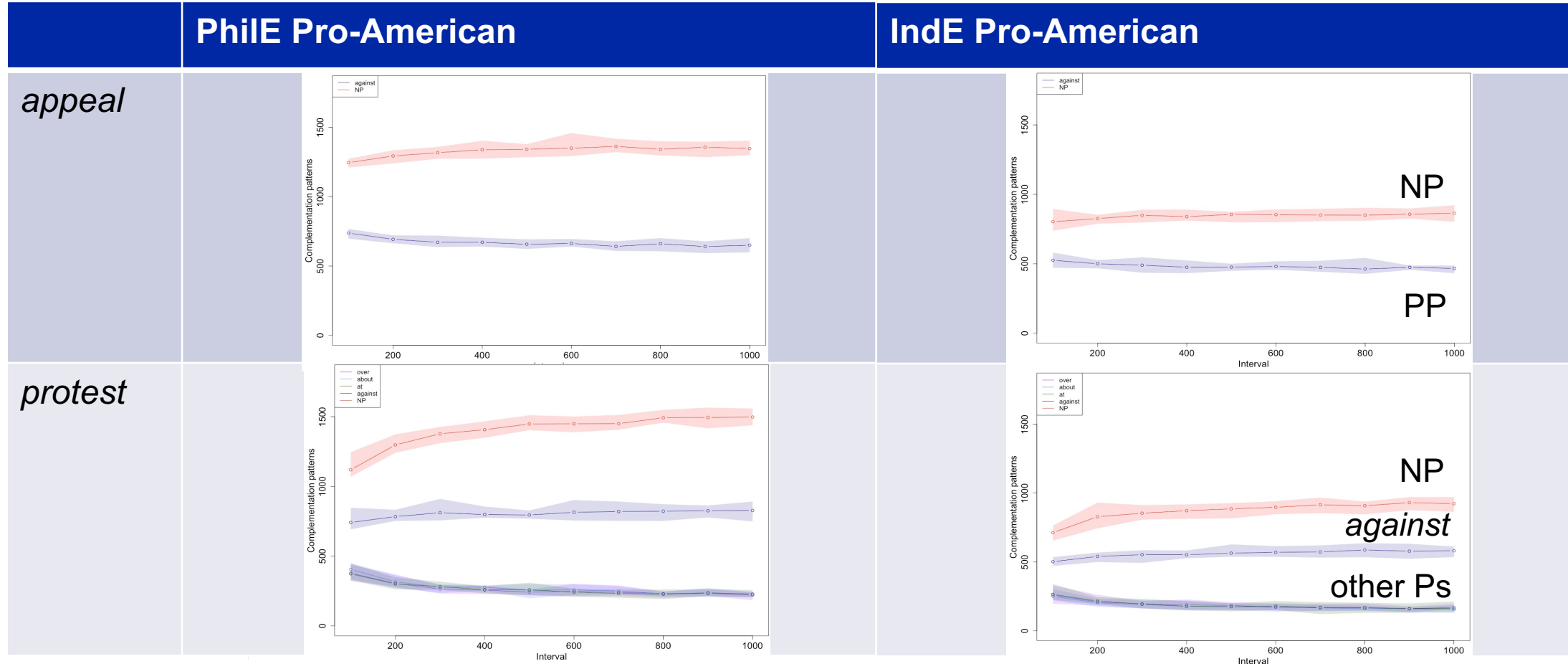Implementation in Python (Laetitia van Driessche & Dirk Pijpops)

Predictions

- Negative attitudes towards AmE will decrease epicentral influence for Indian agents

- PhilE agents will further converge on the AmE model

- *Protest* has a greater range of PPs => this will slow down epicentral attraction from AmE
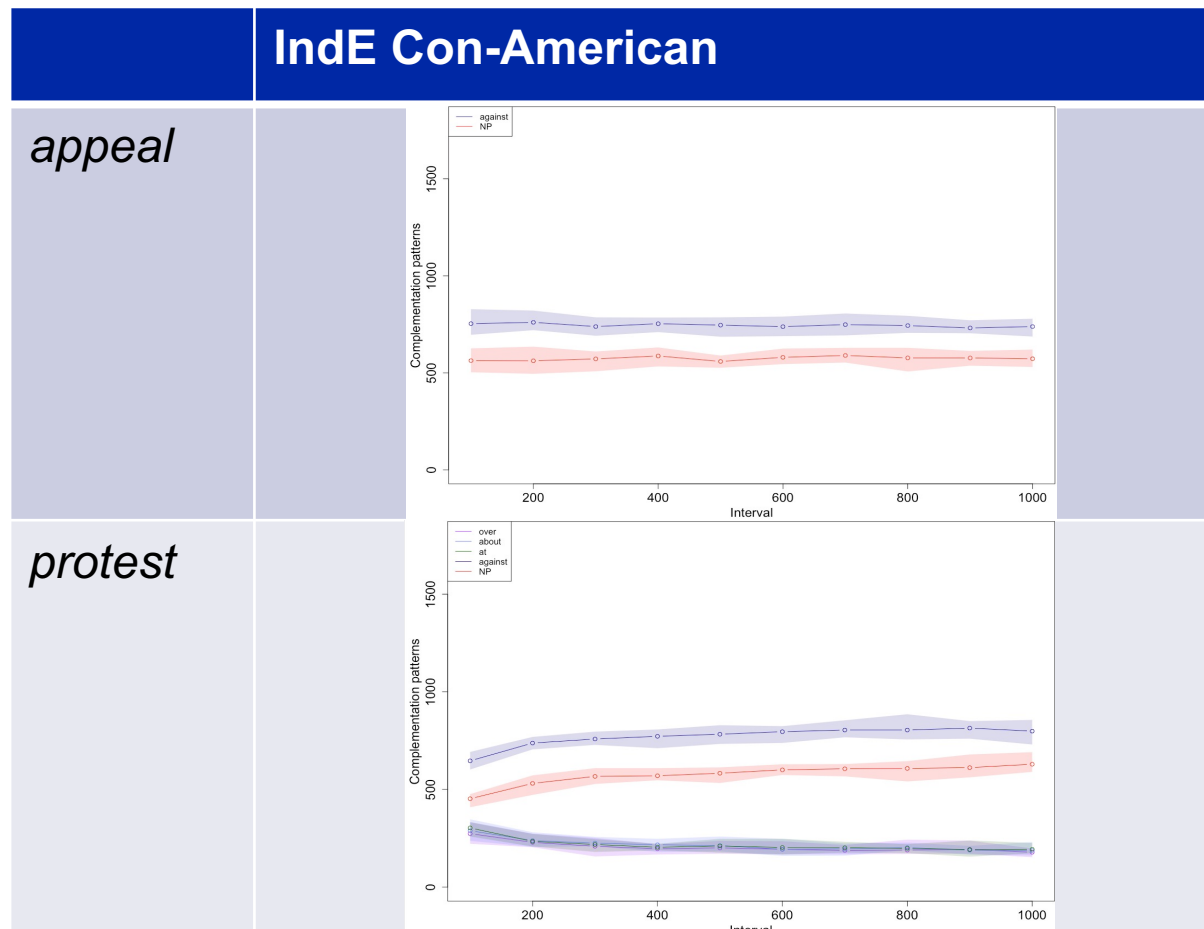
prepositional
English

Results of the simulation: stable matrilectal input

	IndE Con-American	IndE Pro-American
appeal		
protest		

Results of the simulation: stable matrilectal input

	PhilE Pro-American	IndE Pro-American
appeal		
protest		

Results of the simulation: avoidance

	IndE Con-American
appeal	
protest	

Results of the simulation: avoidance + ongoing Americanisation

	IndE Con-American
appeal	
protest	
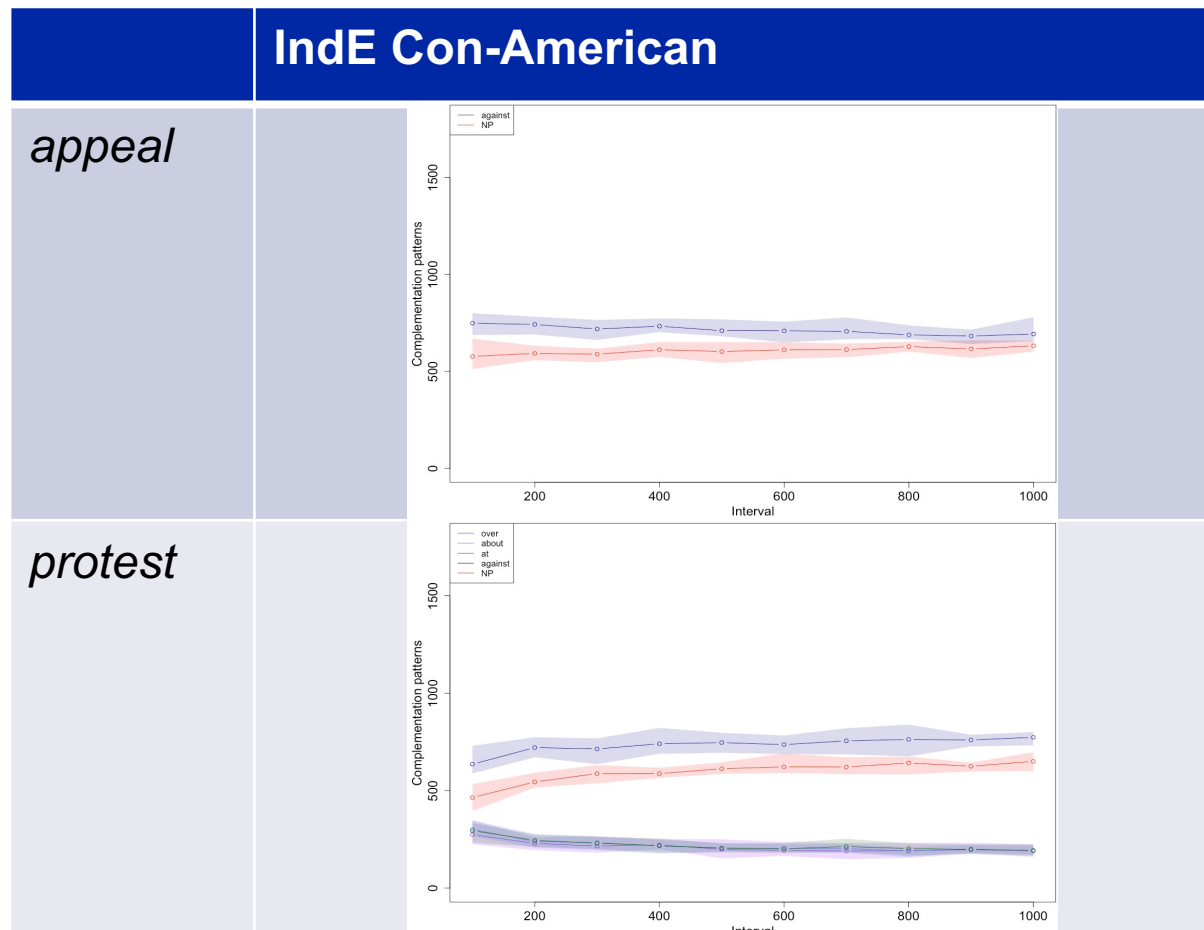
Results of the simulation: condition 2 vs. 3 (con-American IndE)

	Avoidance	Avoidance + Americanisation
appeal		
protest		
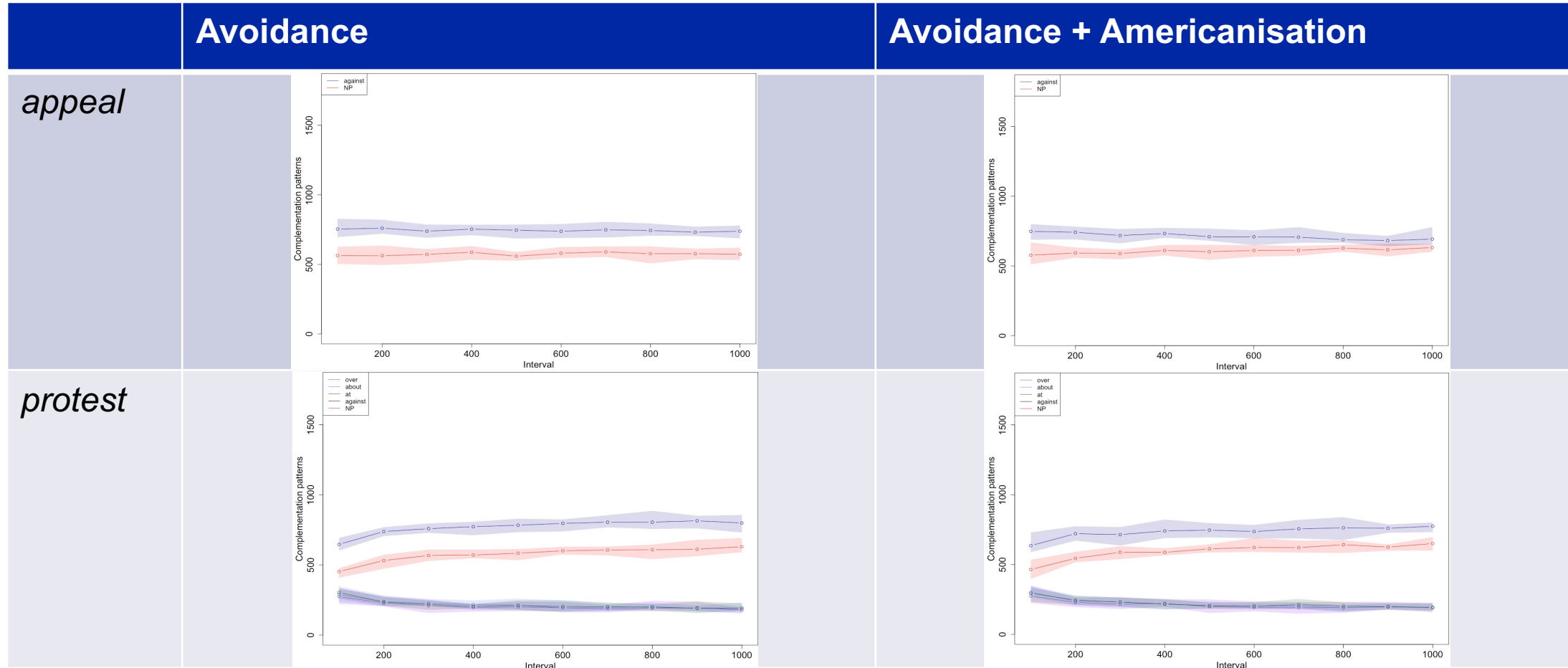
Results of the simulation

Condition 1: No ongoing change and stable matrilectal input

- NPs are preferred and ⬆ over time (PhilE > IndE)
- PPs *(against)*⬇ for *appeal* and ⬆ for *protest*

Avoidance (con-American Indian agents)

- PPs (*against*) are preferred, but there is a slightly higher ⬆ for NPs

Avoidance + Americanisation (con-American Indian agents)

- *appeal*: PPs (*against*) are preferred, but ⬇ ⇔ NPs ⬆ , leading to convergence

- *protest*: NPs and PPs ⬆, but with a smaller difference in frequency than in condition 2

Interpretation of the ABM

Prediction: Negative attitudes towards AmE decreases epicentral influence for Indian agents

- In all conditions (even strong avoidance of AmE sources), the American variant will become the preferred complementation pattern over time.

- A conservative attitude will not stop ongoing trends of Americanisation

Prediction: Philippine agents further converge on the AmE complementation pattern

- but PhilE closely resembles AmE from the outset – epicentral influence???

Prediction: *protest* has a greater range of PPs => this will slow down epicentral attraction from AmE

- In all PP complements, *against* is the dominant preposition

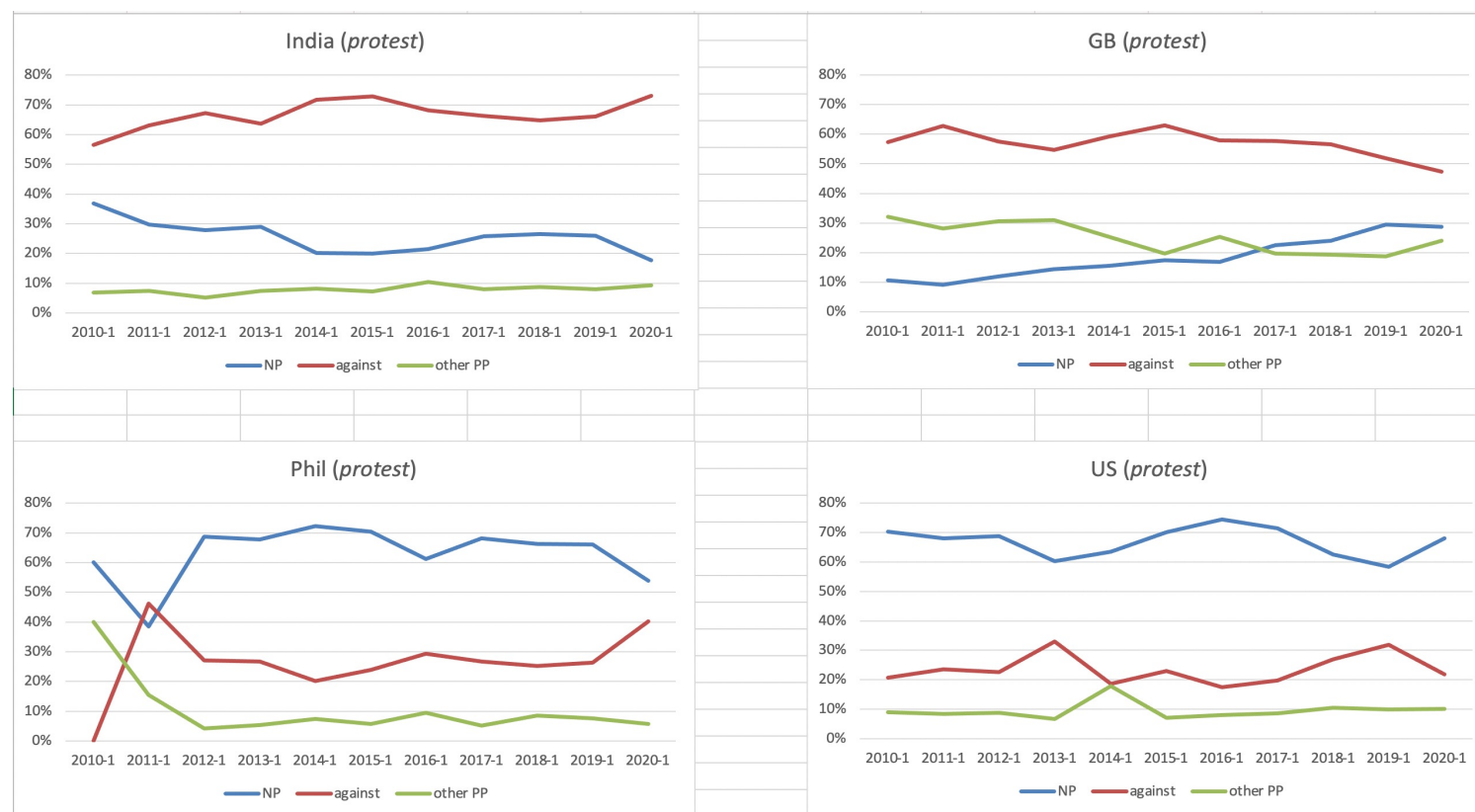- The other PPs do not play a discernible role in slowing down the epicentral pull from AmE
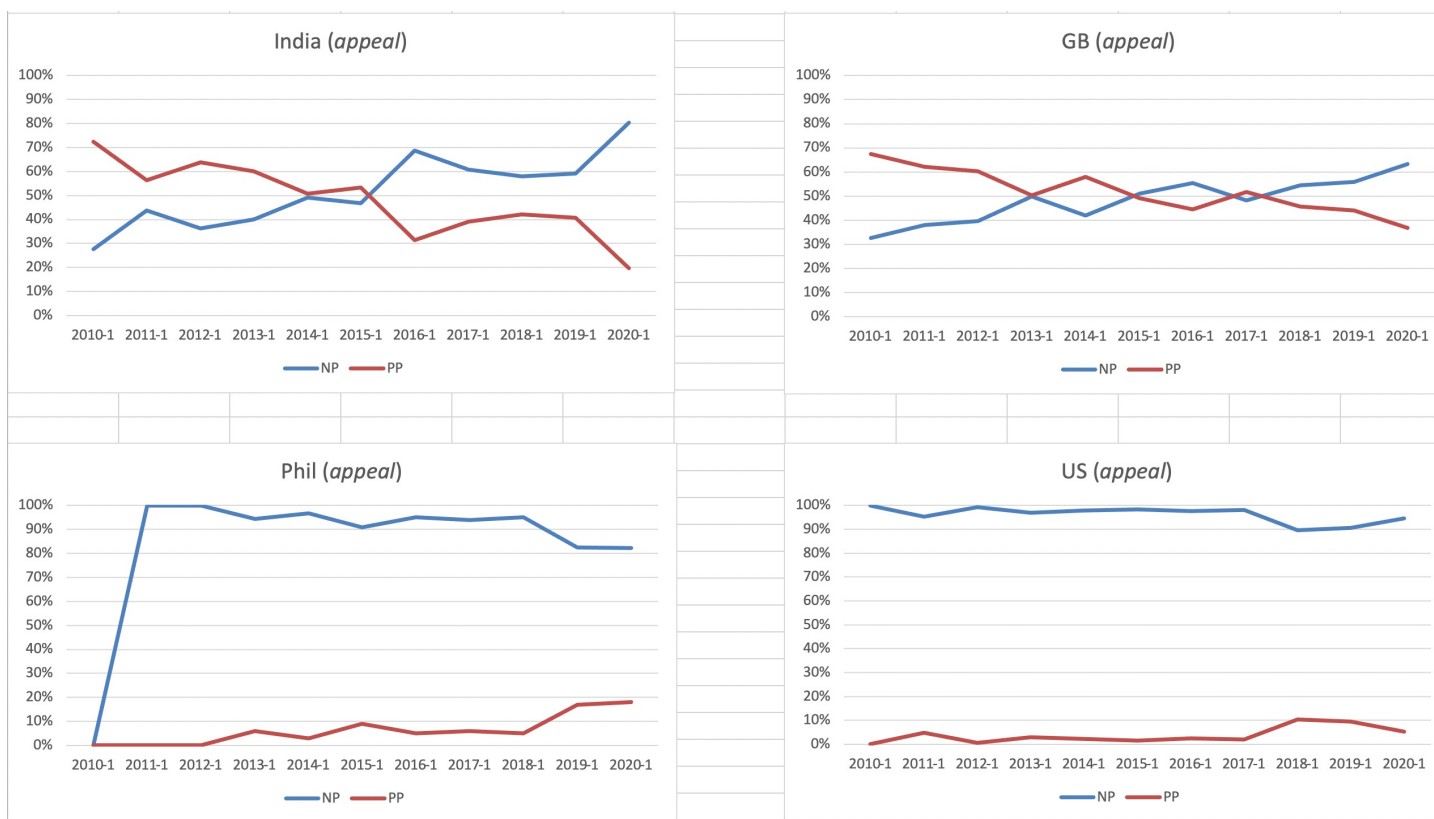
Corpus evidence

Data from the News-on-the-Web (NOW) corpus > investigate micro-changes in the recent past (2010-2021)

Search for VERB followed by THE|A or PREPOSITION

Complementation for *protest* in NOW

Complementation for *appeal* in NOW

Conclusion

- ABM: negative attitudes towards a variety that is assumed to have epicentral 'pull' on speakers usage is unlikely to play out as a significant factor in language change, not only under conditions of stable variation but also with agents actively avoiding the pattern they dislike.

- Simulation of the impact that 'attitude' would have on epicentral influence is a useful backdrop for the interpretation of corpus data. Having established that con-Am attitudes get drowned out by pressure from input and general drift towards AmE complementation patterns in our model, we stand on safer grounds to postulate that the diverging trends we see in the complementation of *protest* in IndE and PhilE are unlikely to be the result of negative attitudes towards AmE as an epicentre.

References

Hundt, M. (1998). *New Zealand English grammar – Fact or fiction? A corpus-based study in morphosyntactic variation*. Amsterdam: John Benjamins.

Hundt, M. (2013). The diversification of English: Old, new and emerging epicentres. In D. Schreier & M. Hundt (Eds.), *English as a contact language* (pp. 182-203). Cambridge: University Press.

Landsbergen, F. (2009). *Cultural evolutionary modeling of patterns in language change: exercises in evolutionary linguistics*. Utrecht: LOT. Livet, P., Phan, D. & Sanders, L. (2014). Diversity and complementarity of agent-based models in the social sciences. *Revue francaise de sociologie, 55*, 463-500.

Hundt, M. (2013). The diversification of English: Old, new and emerging epicentres. In D. Schreier & M. Hundt (Eds.), *English as a contact language* (pp. 182-203). Cambridge: University Press.

Mair, C. (2013). The world system of Englishes. Accounting for the transnational importance of mobile and mediated vernaculars. *English World-Wide*, 34, 253-278.

Rohdenburg, G. (2009). Nominal complements. In G. Rohdenburg & J. Schlüter (Eds.), *One language, two grammars? Differences between British and American English* (pp. 194-211). Cambridge: Cambridge University Press.

van Trijp, R. & Steels, L. (2012). Multilevel alignment maintains language systematicity. *Advances in Complex Systems, 15* (3–4).
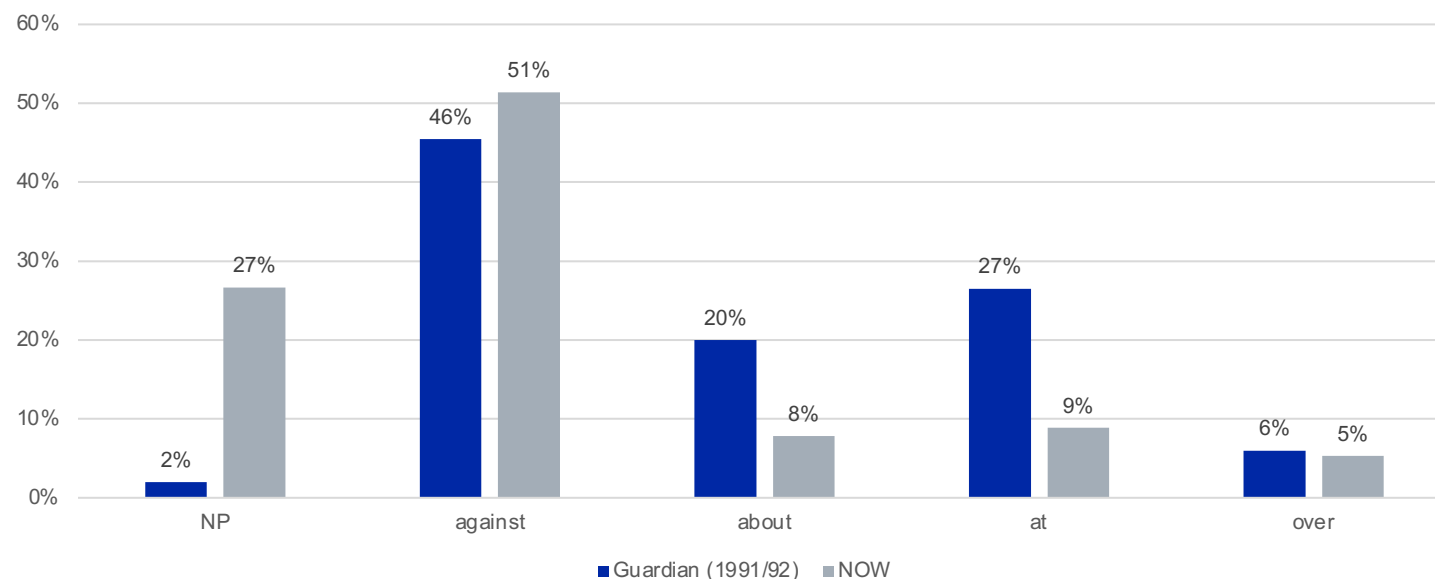
Diachronic trajectory for *protest* in AmE
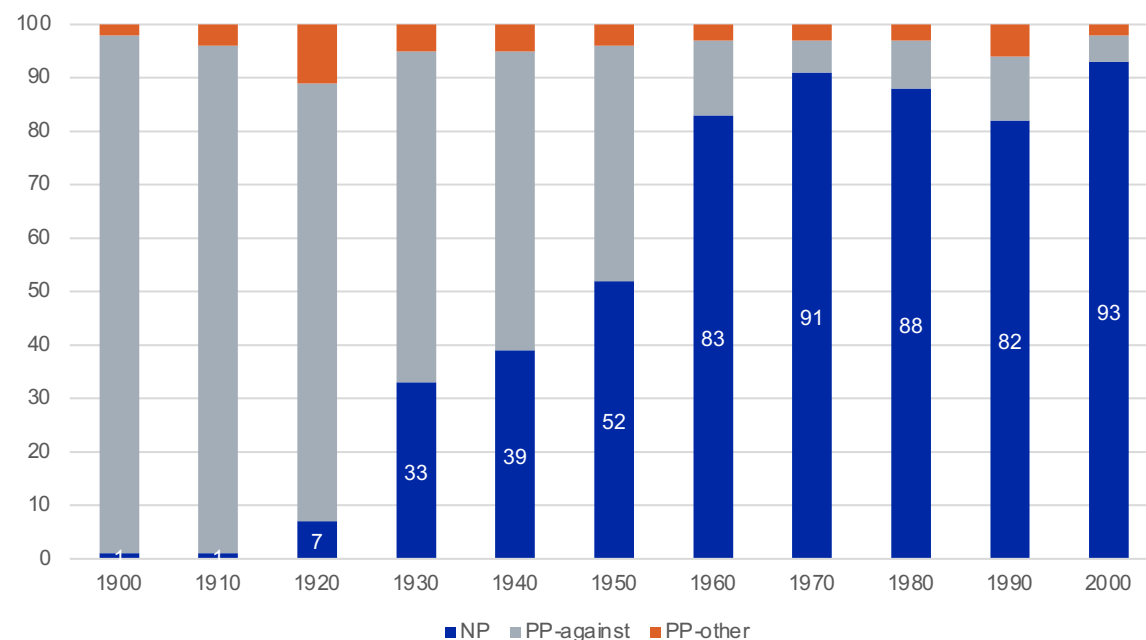
Fig. A-1: Complementation of *protest* in COHA (set of 100 random relevant hits per decade).
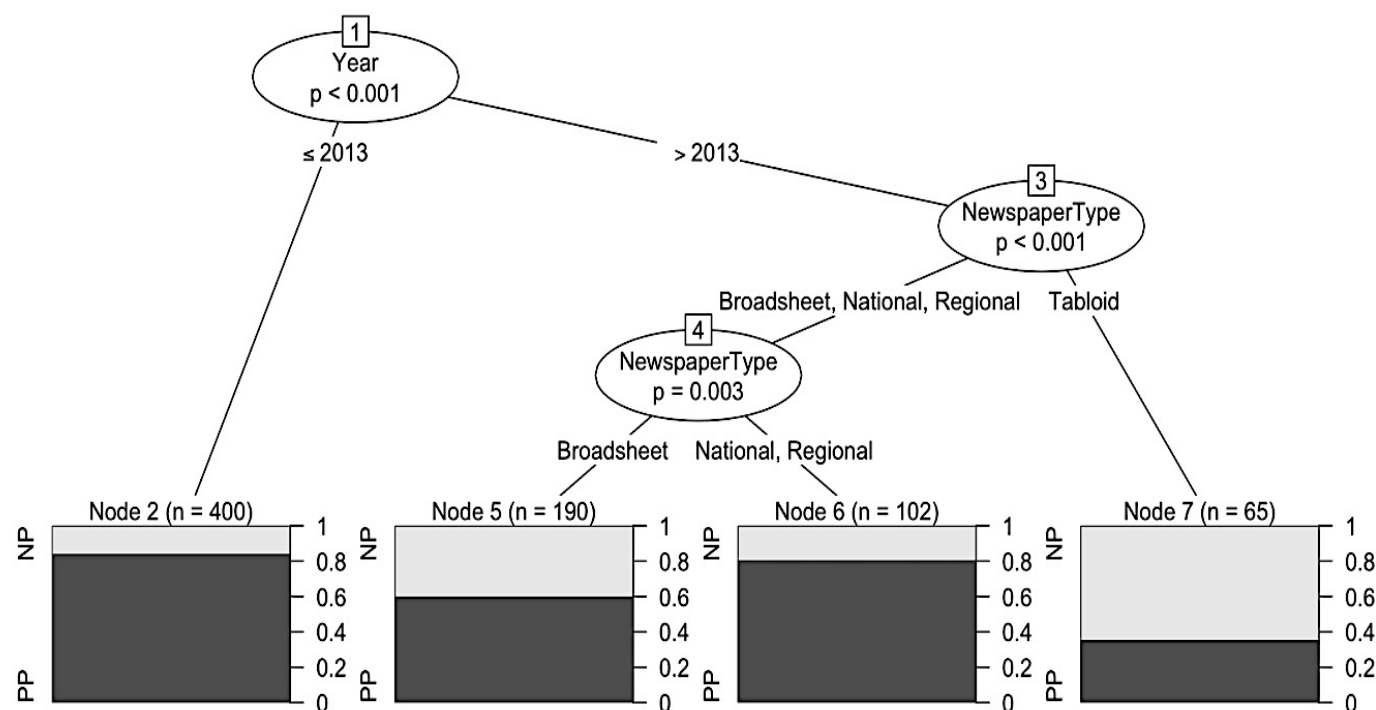
Constructional Americanization?

Fig. A-2: Complementation of *protest* in BrE: 1990s *Guardian* (N=400) vs. 2010+ NOW (N=757).

Constructional Americanization?

Fig. A-3: Complementation of *protest* in BrE: 1990s *Guardian* vs. 2010+ NOW (Somers2 C = 0.583).