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Slides, code, and additional material:
https://github.com/HannaMahler/Oberseminar_2023-11-09

Contrastive Grammar in Use

Quantitative Perspectives on the Verb Phrase in English and German

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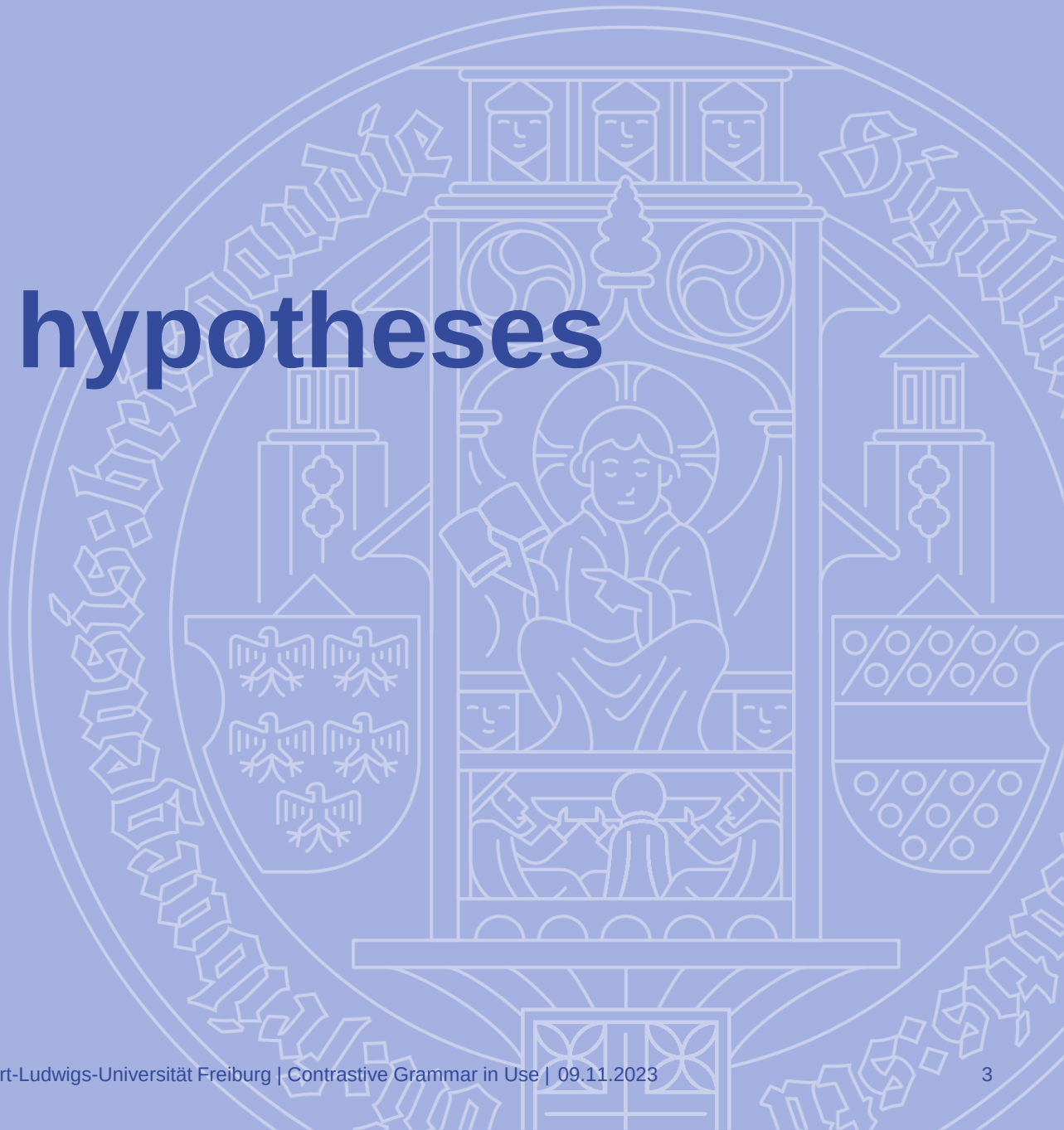
Agenda

1. State of research & hypotheses
3. Methodology & data
4. Results
5. Discussion
6. Conclusion

State of research & hypotheses



Previous research on verb phrase use in English and German

- **common assertion that German is more nominal and English more verbal**
  - e.g., Kortmann & Meyer (1992: 165), Friederich (1969: 83, 88, 91), Königs (2004: 1)
  - Example: (1) “A window displaying outfits”
    (2) “Ein Schaufenster mit Kleidung”
- **state of research: mostly focus on nominal style, few corpus-based studies (using translation material), mostly use of automatic PoS frequencies**
  - Steiner (2012): CroCo corpus, PoS frequencies, more verbs in English
  - Berg et al. (2012): study on compounding, similar frequency of nouns in both languages
  - Fischer (2013): small translation corpus, manual annotation, more verb phrases in English
  - Berg (2017): type and token frequency of word classes, four comparable corpora, English more verbal
  - Neumann (2020): translation corpus, focus on nominal style, German not more nominal

Hypotheses

- **Hypothesis 1: On the whole, English uses more verb phrases than German.**
- **Hypothesis 2: On the whole, English uses more non-finite verb phrases than German.**
- **Hypothesis 3: Cross-linguistically, the use of verb phrases varies by register and mode.**
- **Hypothesis 4: Cross-linguistically, the use of non-finite verb phrases varies by register and mode.**
- **Hypothesis 5: The relationship between information density and frequency of verb phrases is language-specific.**
- **Hypothesis 6: The relationship between information density and frequency of non-finite verb phrases is language-specific.**
- **Hypothesis 7: Cross-linguistically, frequency of use may differ even for parallel non-finite constructions.**

Methodology & data

The corpus: GECCo
Kunz et al. (2021)

- Translation corpus and comparable corpus
- Contains spoken and written data from 14 registers
- Corpus size: around 500,000 words per language (non-translated part)
- Extraction of verb phrases via UPOS-tags, automatic + manual annotation
- Variables annotated: auxiliary or main verb, finite or non-finite, verb form, implicit or overt subject, type of dependent clause (embedded, adverbial, nominal), function of nominal clause (S, O, C_S, C_O)

GECCo
GERMAN ENGLISH CONTRASTS IN COHESION

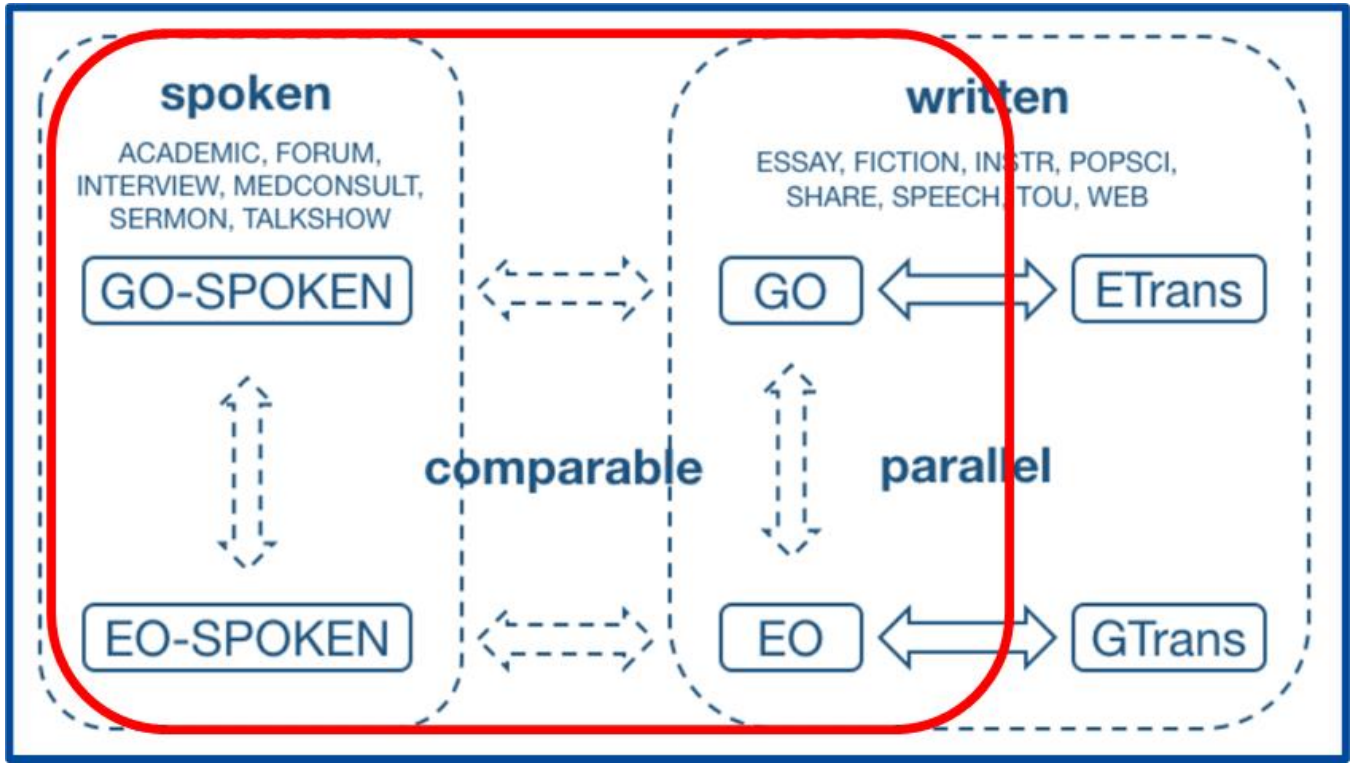


Figure 1: Composition of GECCo corpus (taken from https://fedora.clarin-d.uni-saarland.de/gecco/index.html last accessed 21.05.2023)

Statistical procedure

Bayesian mixed effects Poisson regression modelling

What we want to predict

Count of verb phrases (for each text)

Count of non-finite verb phrases (for each text)

What we can use as predictors

- Language (binary, sum-coded, fixed effect)
- Mode (binary, sum-coded, fixed effect)
- Standardized type-token ratio (continuous, z-scored, fixed effect)
- Register (categorical, sum-coded, random effect)
- Text length (exposure variable)
- Interaction of mode and language
- Interaction of language and STTR

Results

The contribution of non-finite verb phrases to the overall VP count

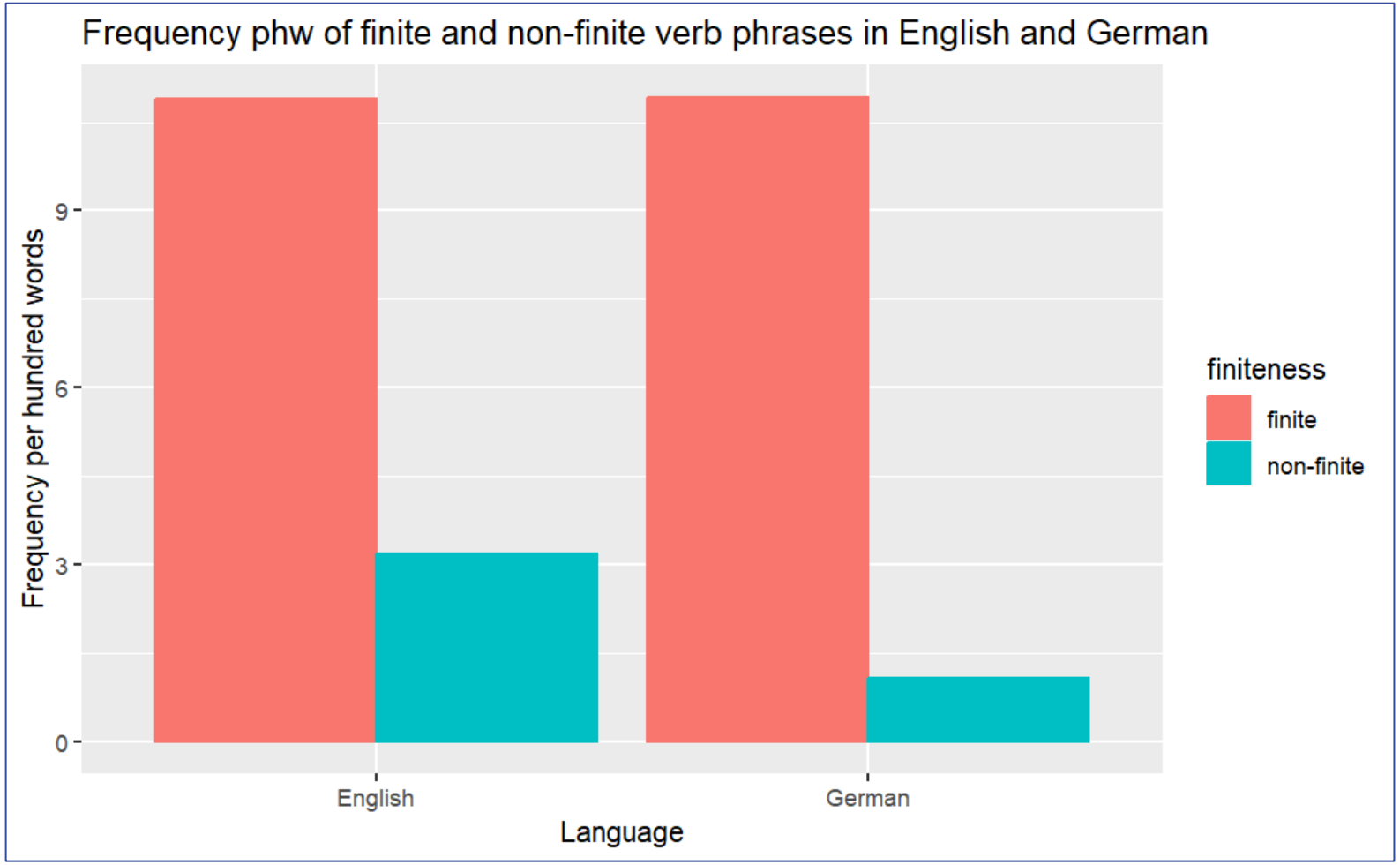


Figure 2: Frequency phw of finite and non-finite verb phrases in GECCo by language.

The most over-represented non-finite verb phrases in English

Verb form	Overt subject	Clause type and syntactic function	Frequency difference phw	Frequency phw English	Frequency phw German
to/*zu*-infinitive	no	nominal clause as object	0.49	0.71	0.22
present participle	no	embedded clause	0.44	0.48	0.04
to/*zu*-infinitive	no	adverbial clause	0.29	0.43	0.14
present participle	no	adverbial clause	0.19	0.20	0.01
to/*zu*-infinitive	no	nominal clause as subject complement	0.18	0.28	0.10
to/*zu*-infinitive	no	embedded clause	0.15	0.35	0.20
past participle	no	embedded clause	0.08	0.17	0.09

Table 1: Non-finite structures with a higher frequency phw in English compared to German.

Overall frequency of verb phrases in GECCo

Example: texts with highest ‘verbiness’

- (3) So I [don't know] whether you [want] [to go] and [see] her rather than, I [could get] a doctor [to go] and [see] her and [phone], (EO_MEDCONSULT_002)

- (4) "Danke, Juli. Und [geh] mal ins Bett, [hörst] du. [Ist] schon spät. Ich [schlaf] jetzt auch."
  (GO_FICTION_006)

Example: texts with lowest ‘verbiness’

- (5) The Einstein Planetarium [projects] images about space and astronomy onto a star-filled, domed ceiling. The Lockheed Martin IMAX Theater [shows] large-format films on a screen five stories high. (EO_WEB_008)

- (6) Mit Bus oder Bahn bequem zum Startpunkt einer Wanderung und abends wieder stressfrei zurück, das [ermöglichen] im Schwarzwald die öffentlichen Verkehrsmittel. (GO_TOU_014)

Verb phrases and mode

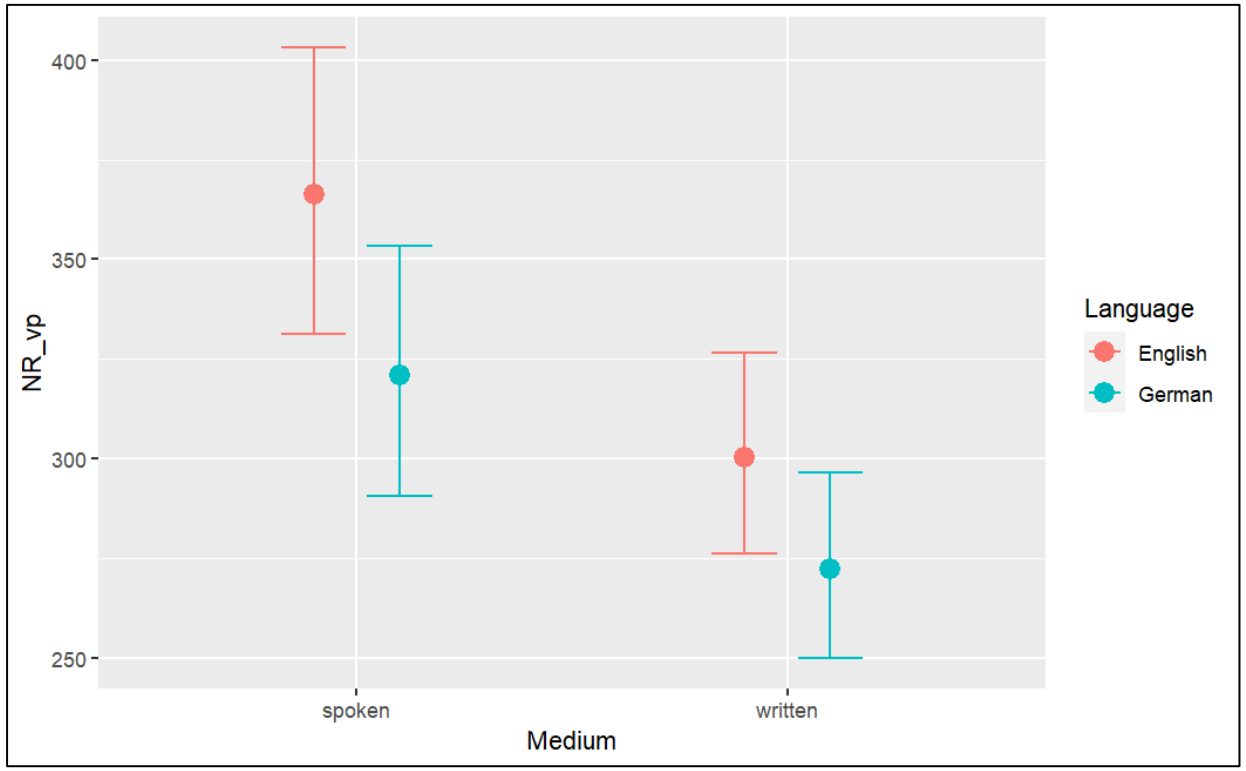


Figure 3: **Number of verb phrases** in a text of average length (2,439 words) by mode and language, as predicted by the regression model.

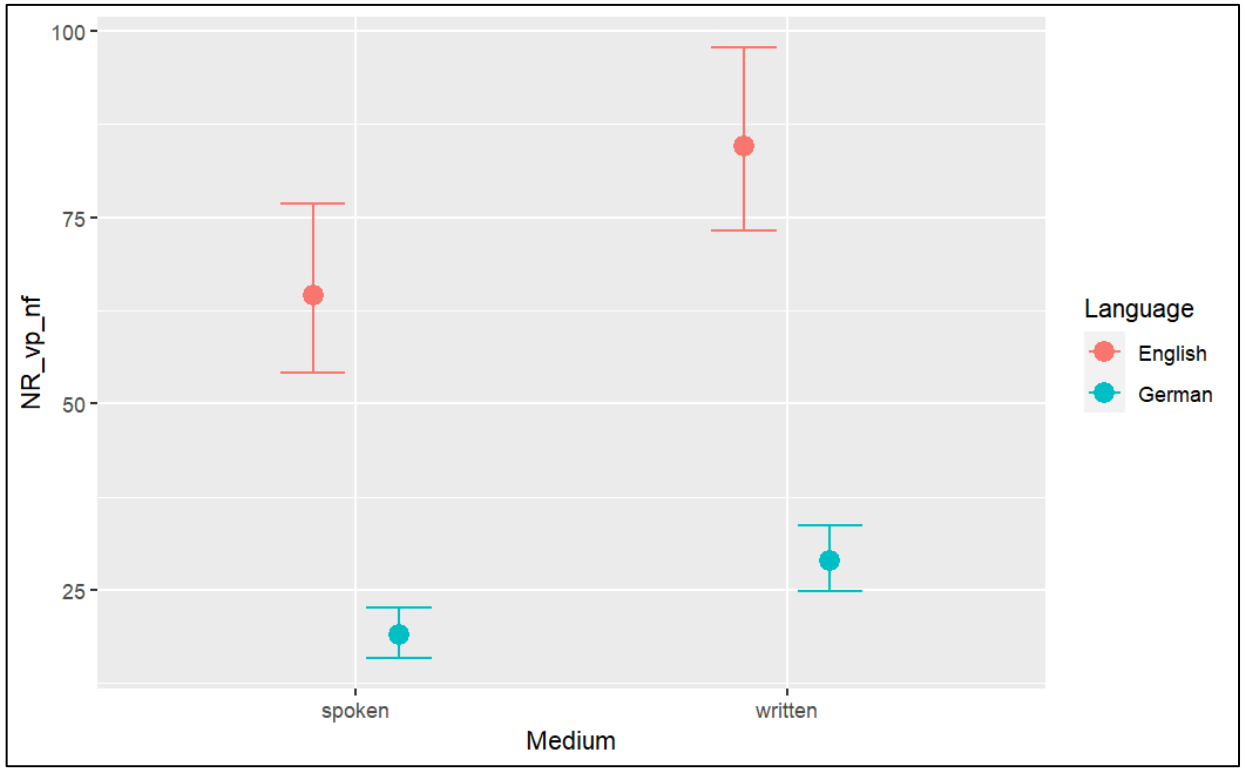


Figure 4: **Number of non-finite verb phrases** in a text of average length (2,439 words) by mode and language, as predicted by the regression model.

Verb phrases and type-token-ratio

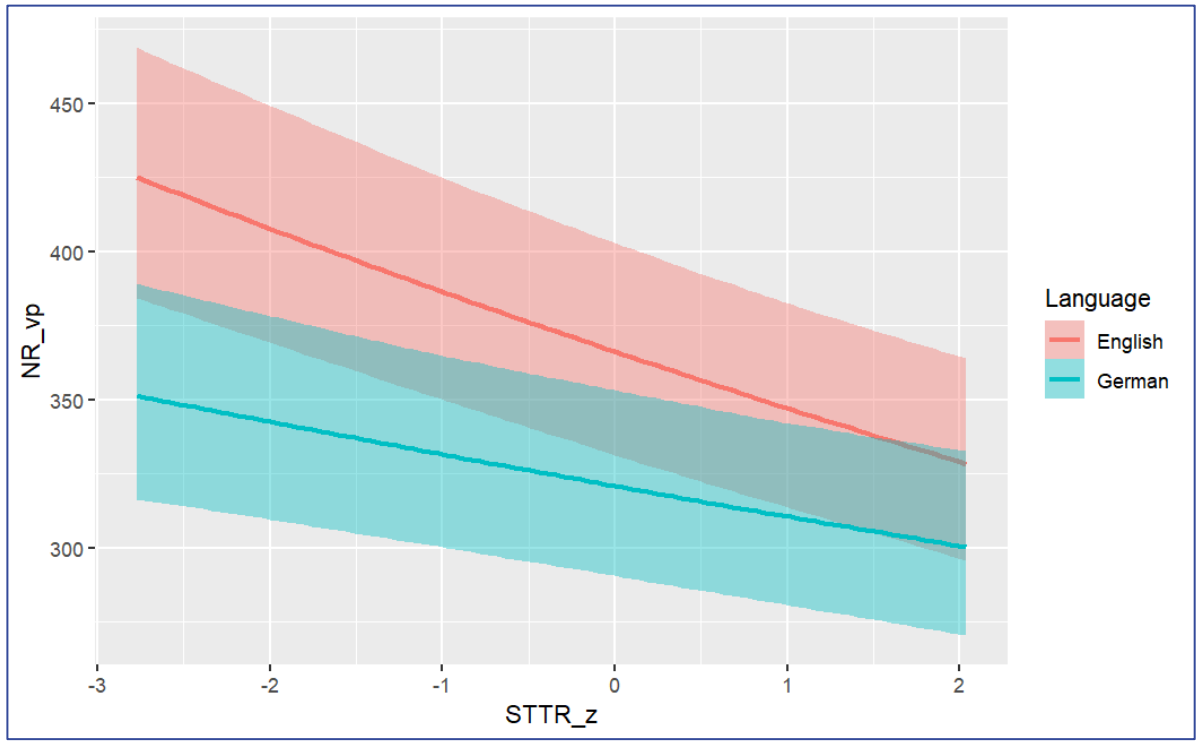


Figure 5: Number **of verb phrases** in a text of average length (2,439 words) by density (STTR_z) and language, as predicted by the regression model.

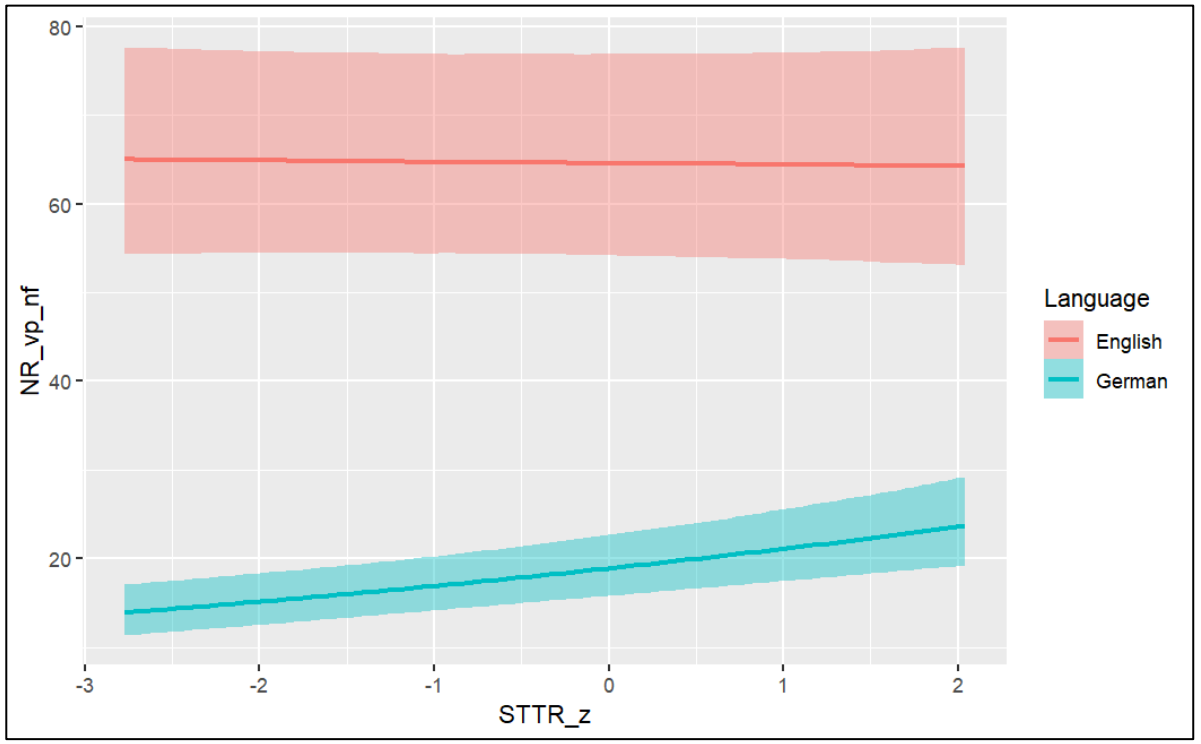


Figure 6: Number of **non-finite verb phrases** in a text of average length (2,439 words) by density (STTR_z) and language, as predicted by the regression model.

Main findings

- English uses **more verb phrases** and considerably **more non-finite verb phrases**. The non-finite verb phrases are most likely the **main reason** for the higher overall frequency of verb phrases in English.
- **Spoken language:** high frequency of verb phrases, lower frequency of non-finite verb phrases, higher frequency of the *to*/*zu*-infinitive and of nominal clauses. **Written language:** not as many verb phrases, more non-finite verb phrases, higher frequency of participles, adverbial clauses, and embedded clauses.
- Relevance of **verb forms** for contrast: *to*/*zu*-infinitive > present participle > past participle > bare infinitive.
- English not only has more **grammatical options** for non-finite verb phrases, but also makes more frequent use of the options that are also available in German.
- Main factors impacting verbal style: language and mode. Information density only plays a minor role. Extensive variation by register.
- Correlation between **information density** and frequency of non-finite verb phrases: weak positive correlation in German, but there no apparent correlation in English.

Main findings

This all points to the conclusion that English non-finite verb phrases **penetrate all instances of language use** and could to an extent be called **grammatically determined**. In German, the use of non-finite verb phrases can be characterised as more ‘**multifactorial**’, as they appear to be preferred in certain environments (written texts, high information density, certain registers).

Discussion

Relation to existing findings & generalisations

- Hawkins (2019): word-external (in English) vs. word-internal properties (in German)

  → further support for his theory through my results, non-finite verb phrases heavily rely on word-external properties

- Kortmann & Meyer (1992): English as a verb-oriented language (vs. German noun-oriented)

  → generally yes, but the extent of the contrast depends on register & mode

- Fischer (2013): English uses more non-finite verb phrases, contrast mostly comes from present participle and *to*-infinitive with overt subject

  → in my data the *to*-infinitive with implicit subject is the most important structure, overt subjects not really relevant

Language-specific conditions for verbal style: Differences in basic constituent order

- languages differ in their ways to achieve efficient realisations (e.g. Wurzel 2001: 385)
- Kortmann & Meyer (1992): German is (at least in parts) a verb-final language, the argument structure needs to be kept as simple as possible, but the arguments themselves can be expanded. English, as an SVO-language, can afford to introduce several argument-predicate structures (1992: 165)
- Doherty (1996: 452) calls the right-branching structure that we see in English “theoretically open-ended”. The basic constituent order in English is therefore more open to including clausal constituents (Doherty 1996: 452): “Attaching elements to the right means following the natural order of a right-branching language, like English”. In German, rendering constituents as clauses would, however, quickly over-burden the sentence bracket (Doherty 1996: 452).

Language-specific conditions for verbal style: Differences in basic constituent order

English: SVO, “right-branching”, open-ended

(7) and he was thinking of these as atoms more or less and, uh *trying* to understand nature, through the possible arrangements that you can have, for spheres … (EO_ACADEMIC_001)

(8) But he does *try* to reassure them, himself as much as his two daughters. (EO_FICTION_005)

German: SOV, “left-branching”, sentence bracket

(9) die Antidiskriminierungsstelle *versucht* die Landespolitik aktiv zu beeinflussen (GO_TOU_021)

(10) ja, und danach *hab*' ich dann *versucht*, [einen Job zu finden] (GO_INTERVIEW_007)

(11) ? ja, und danach *hab*' ich dann [einen Job zu finden] *versucht*

But: Why non-finite subordinate clauses specifically?

So far, the argumentation would hold for finite and non-finite clauses…

Doherty (1996: 453) explains this tendency with the necessity to keep the original matrix clause "open":

> the opening up of new clauses can be understood to signal the end of the preceding clause. Processing ease in an open-ended type of structure will, instead, promote indicators preventing the process of closing down. Thus, […] the preference for non-finite verb phrases could help to keep structures open while offering another verbal anchor for further structural extension (1996: 453).

	German	**English**
Non-finite subordinate clause	(12) Angesichts […] war es im Interesse unserer Aktionäre nicht länger zu akzeptieren, weiterhin allein das gesamte Risiko **zu tragen**. (GO_SHARE_003)	(14) or why the hunters, […], now accept **to drag** around with them over the tired land all the heavy guns […] (EO_FICTION_005)
Finite subordinate clause	(13) Wir mußten einen Weg finden, der es amerikanischen Richtern erlaubt zu akzeptieren, **daß** sich Regierungen […] auf eine komplexe Lösung **geeinigt hatten** […] (GO_SPEECH_009)	(15) Rather, we need to accept **that** the Treaty **is** fundamentally in conflict with […] (EO_SPEECH_003)

“Grammatical determinism” of non-finite verb phrases in English?

Is the relationship between matrix verb and non-finite verb phrase more grammaticalized in English than in German? Are non-finite clauses in post-predicate position more grammatically determined in English?

Potential arguments:

- Vast areas of “intermediate verbs” in English, but not in German.
- No relationship between information density and non-finite verb phrases in English → not distributed stylistically
- More English matrix verbs allowing or requiring non-finite clauses (Mair 1990)
- The sheer number of *to*-infinitives serving as object clauses in English compared to German

Counterargument: this only concerns nominal clauses. Embedded clauses and adverbial clauses also play a role.

Conclusion

Conclusion

Main findings:

- Existing assumptions about use of verb phrases (and non-finite verb phrases) are overall confirmed
- English deserves its title as a language that is more verbal than German
- Basic constituent order seems like the likely reason for the higher frequency of verb phrases and non-finite verb phrases in English.
- Non-finite verb phrases are deeply entrenched in English grammar, may be called “grammatically determined”
- Language-internal variation is important to take into account
- Importance of looking at spoken material (this is where language-specific features shine)

Conclusion

Reasons to be sceptical:

- Comparability of corpus components
- Corpus representativeness
- Combination of automatic and manual coding does not lead to 100 percent accuracy
- Difficulties in clearly delimiting verb phrases
  - Verbs vs. nouns
  - Auxiliary verbs vs. main verbs
  - Participles vs. adjectives

Reasons to be confident:

- Results are overall in line with existing research and assumptions
- Regression model is very sure of its estimates
- More methodological caution than previous studies (no translation effects, more data, not only count of PoS-tags, extensive quality control)

Thank you for your attention.

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References

Berg, Thomas. 2017. Compounding in German and English: A Quantitative Translation study. In *Languages in Contrast* 17 (1). pp. 43–68.

Berg, Thomas; Helmer, Sabine; Neubauer, Marion; Lohmann, Arne (2012): Determinants of the Extent of Compound Use. A Contrastive Analysis. In *Linguistics* 50 (2), pp. 269–303. DOI: 10.1515/ling-2012-0010.

Doherty, Monika (1996): Introduction. In *Linguistics* 34, pp. 441–457.

Fischer, Klaus (2013): *Satzstrukturen im Deutschen und Englischen: Typologie und Textrealisierung* (Konvergenz und Divergenz 1). Berlin: Akademie Verlag.

Friederich, Wolf. 1969. *Technik des Übersetzens: Englisch und Deutsch*. Ismaning: Max Hueber.

Gast, Volker (2013): Contrastive Analysis. In : *The Routledge Encyclopedia of Language Teaching and Learning*. London: Routledge, pp. 153–158.

Gast, Volker; Levshina, Natalia (2014): Motivating w(h)-Clefts in English and German. A Hypothesis-Driven Parallel Corpus Study. In Anna-Maria Cesare (Ed.): *Frequency, Forms and Functions of Cleft Constructions in Romance and Germanic*. Berlin, München, Boston: De Gruyter, pp. 377–414.

Gries, Stefan; Jansegers, Marlies; Miglio, Viola (2020): Quantitative Methods for Corpus-Based Contrastive Linguistics. In Renata Enghels, Bart Defrancq, Marlies Jansegers (Eds.): *New Approaches to Contrastive Linguistics. Empirical and Methodological Challenges*. Berlin, Boston: De Gruyter, pp. 53–84.

Hawkins, John (2019): Word-External Properties in a Typology of Modern English. A Comparison with German. In *English Language and Linguistics* 23 (3), pp. 701–727. DOI: 10.1017/S1360674318000060.

Kortmann, Bernd & Paul Meyer. 1992. Is English Grammar more Explicit than German Grammar, after all? In Christian Mair & Manfred Markus (eds.), *New Departures in Contrastive Linguistics: Proceedings of the Conference Held at the Leopold-Franzens-Universität Innsbruck, Austria, 10-12 May 1991* (Innsbrucker Beiträge zur Kulturwissenschaft / Anglistische Reihe 4), Innsbruck: Verlag des Institutes für Sprachwissenschaft. 155–166.

Königs, Karin (2004): *Übersetzen Englisch-Deutsch: Ein Systematischer Ansatz*. 2nd edition. München: Oldenburg Wissenschaftsverlag (Lehr- und Handbücher zu Sprachen und Kulturen).

Kunz, Kerstin/Lapshinova-Koltunski, Ekaterina/Martínez Martínez, José M./Menzel, Katrin/Steiner, Erich (2021): *GECCo - German-English Contrasts in Cohesion: Insights from Corpus-Based Studies of Languages, Registers and Modes* (Trends in Linguistics. Studies and Monographs 355). De Gruyter Mouton.

Mair, Christian. 1990. *Infinitival Complement Clauses in English. A Study of Syntax in Discourse*. Cambridge: Cambridge University Press (Studies in English Language).

Neumann, Stella. 2020. Is German more Nominal than English?: Evidence from a Translation Corpus. In Renata Enghels, Bart Defrancq & Marlies Jansegers (eds.), *New Approaches to Contrastive Linguistics: Empirical and Methodological Challenges*. Berlin, Boston: De Gruyter. 127–158.

Steiner, Erich. 2012. A Characterization of the Resource Based on Shallow Statistics. In Silvia Hansen-Schirra, Stella Neumann & Erich Steiner (eds.), *Cross-Linguistic Corpora for the Study of Translations: Insights from the Language Pair English-German* (Text, Translation, Computational Processing 11). Berlin, Boston: De Gruyter Mouton. 71–89.

Delimiting verb phrases

German

- Counted as one verb phrase:
  - Auxiliary verb + non-finite verb form (*haben, sein, werden, bekommen, kommen,* …)
  - Modal verbs + non-finite verb form (*werden, dürfen, können, müssen, brauchen, …*)
- Counted as two verb phrases:
  - Full verbs + infinitive form (*gehen, fahren, lehren, lernen, hoffen, beginnen*, …)
  - Verbs of perception and causation + non-finite verb form (*sehen, hören, lassen*, …)

English

- Counted as one verb phrase:
  - Central modals + non-finite verb form (*can, may, might, should, will, would, mus*t, …)
  - Marginal modals + non-finite verb form (*dare, need, ought to, used to*)
- Counted as two verb phrases:
  - Full verb + non-finite verb form (*hope, wish, want, like, decide,* …)
  - “Intermediate verbs”
    - Modal idioms + non-finite verb form (*had better, be to, have got to, would rather*)
    - Semi-auxiliaries (*have to, be about to, be going to, be likely to,* …)
    - Catenatives + non-finite verb form (*happen to, tend to, seem to, come to,* …)

Quality of the annotation of sentence boundaries in the GECCo corpus

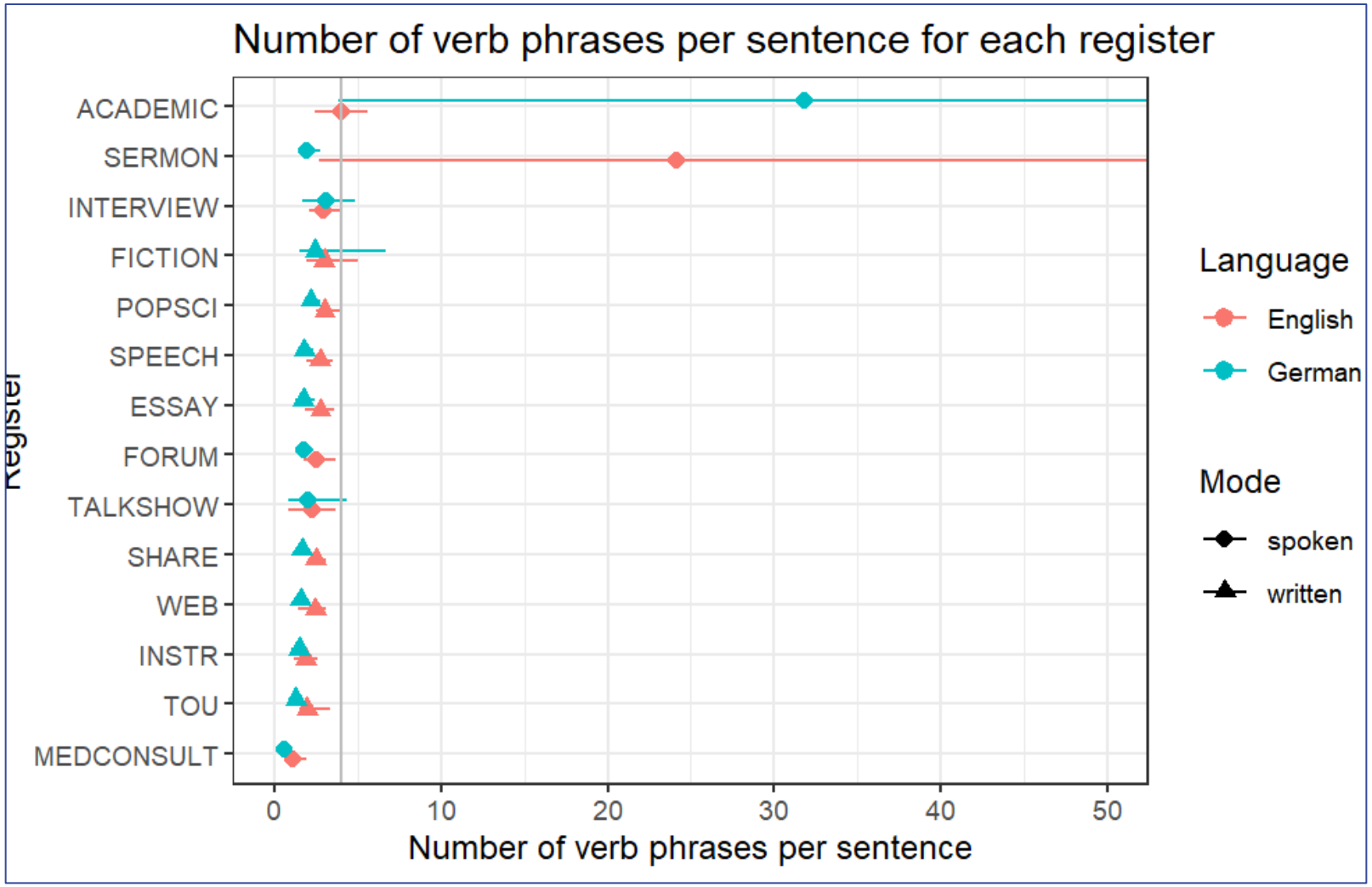

Figure 7: Frequency of verb phrases per sentence in GECCo corpus.

Clustering solution of registers in GECCo based on frequency of finite and non-finite verb phrases

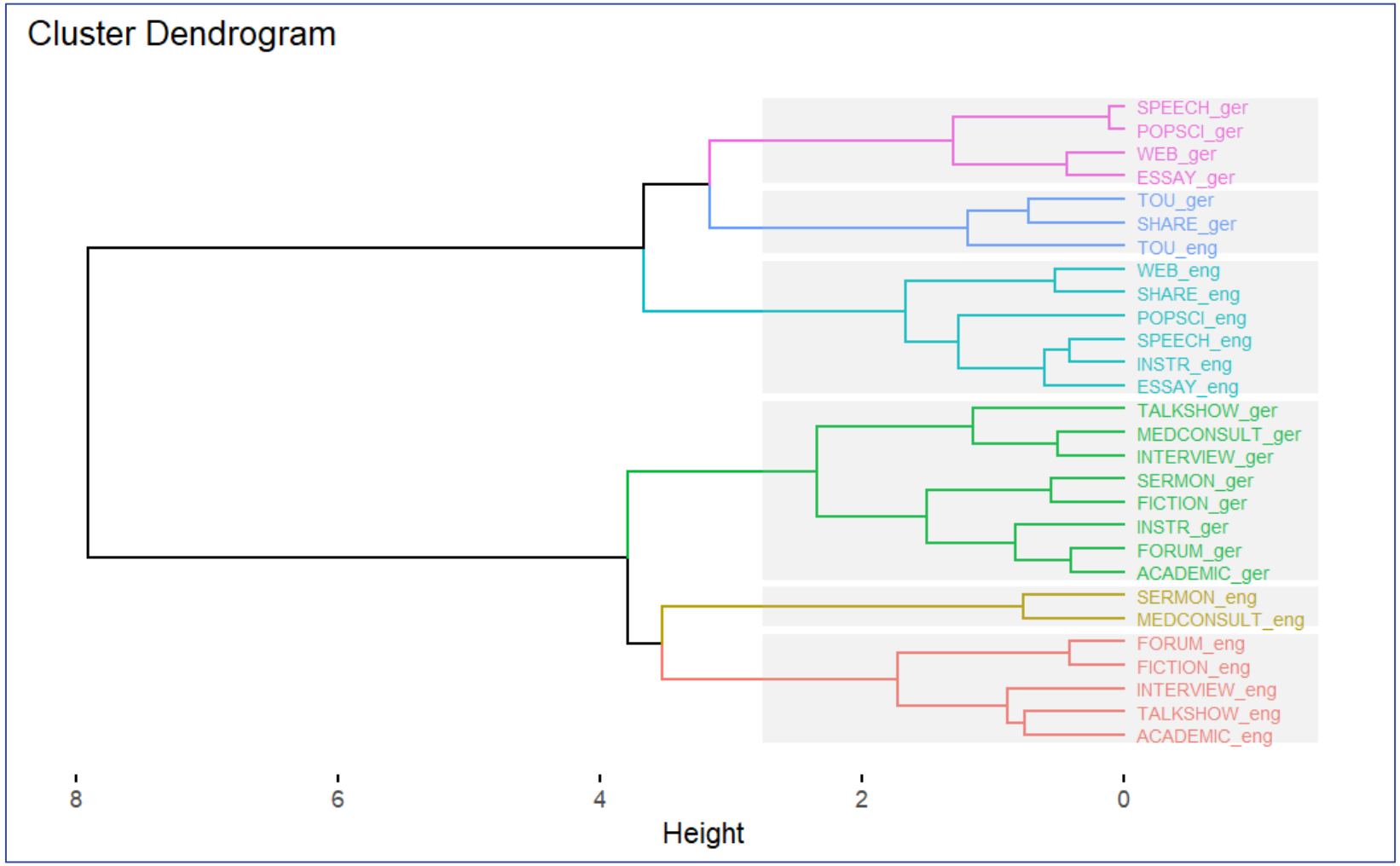

Figure 8: Cluster solution for registers in GECCo.

Methodological framework:
Quantitative, corpus-based contrastive linguistics

- Lack of quantitative methods mentioned by Gast (2013: 5), see also comments in Gries et al. (2020)
- Examples of recent work:
  - Neumann (2020): mixed-effects regression
  - Gries et al. (2020): inference trees, random forests, clustering, network analysis
  - Gast & Levshina (2014): correspondence analysis

The contributions of statistical methods to contrastive linguistics:

- Focus on relative preferences of languages for certain construction
- Shed light on varying importance of factors influencing the choice of construction in language A and B
- Move from "**contrastive grammar**" (comparison of decontextualised system of choices) to "**contrastive grammar in use**" (choices made in textual contexts)

Statistical procedure

Bayesian mixed effects Poisson regression modelling

Assumptions about frequency of VPs

Observed frequency of VPs in GECCo

Prior distribution ✖ **Data** = **Posterior distribution**