

Is redundancy useful in language? Agent-Recipient disambiguation in English and Dutch

This paper discusses the competing motivations of efficiency versus robustness in language processing and learning (MacWhinney et al. 2014), both from a typological and diachronic perspective. Specifically, we assess the potential benefits or costs of redundancy in morphosyntactic marking of participant roles, comparing and testing two opposing hypotheses:

On the one hand, following the most crucial tenet in usage-based linguistics that language use affects – or even determines – grammar (Bybee 2010), we assume that language is organised in a way that facilitates efficient usage (e.g. Gibson et al. 2019). On this account, redundant marking should be dispreferred. Well-known typological ‘trade-off’ distributions and diachronic trajectories between word order and morphological case marking seem to support this point (e.g. Fedzechkina et al. 2017); furthermore, prepositional marking is e.g. often only applied in contexts where it comes with some added processing benefit (cf. e.g. Pijpops et al. 2018 on the impact of complexity on Dutch transitive object marking, or Tal et al. 2020 on ambiguity/atypicality in differential object marking). On the other hand, however, we pursue Van de Velde's (2014) argument that a certain amount of redundancy – or rather, ‘degenerate’ marking (involving many-to-many relationships) – is in fact beneficial from a usage perspective: redundancy constitutes an indispensable component of any degenerative Complex Adaptive System, and thus also of language (Steels 2000; Beckner et al. 2009). Such redundancy/degeneracy comes with two important advantages, viz. robustness and evolvability: most importantly for the present paper, the former entails that redundant marking offers protection against information loss in the noisy language channel, even though it may be less efficient.

Our case study to assess the plausibility of what we call the ‘strict-efficiency’ versus the ‘robustness’ account is participant role marking in ditransitive clauses in Present Day Dutch and English as well as historical English. More precisely, we investigate the interaction between strategies used to distinguish agents and recipients in transfer-events, e.g. with verbs of giving as in (1), across languages and time.

(1) They [AGENT] give some cake to the student [RECIPIENT].

Since both agents and recipients are both prototypically animate (sentient) and volitional (e.g. Newman 1998; Naess 2007; Haspelmath 2015), disambiguating these roles based on semantic-pragmatic information is usually difficult if not impossible, and morpho-syntactic cues are crucial in determining ‘who gave what to whom’. Among the most common strategies language users have at their disposal are (i) fixed constituent order (e.g. SVO in Present Day English), (ii) case marking/ formal differentiation (e.g. subject vs object pronoun forms in PDE), (iii) subject-verb agreement, and (iv) prepositional marking. Employing multiple strategies at the same time constitutes redundant marking; for example, in (1) all four disambiguation strategies are given.

We make use of the *Sonar Corpus of Written Dutch* (Oostdijk et al. 2013), the *ICE-GB* (Röthlisberger 2018) and the *Penn Parsed Corpus of Middle English* (PPCME2; Kroch et al. 2000); instances of ditransitive clauses are extracted from the corpora, and coded for the strategies instantiated by them. Following the ‘strict-efficiency’ account, we then expect language users to prefer employing only one or maximally two strategies at the same time. By contrast, based on the degeneracy/ robustness account, we anticipate sentences that simultaneously instantiate two or three strategies to be most common, and cases where only one strategy is at work to be rare. Our results indicate that even though the precise strategies and their distribution differs between Dutch and English, both languages show substantial redundancy; furthermore, we find that English appears to have moved towards more redundant marking over time.

References

- Beckner, Clay, Richard Blythe, Joan Bybee, Morten Christiansen, William Croft, Nick Ellis, John Holland, Jinyun Ke, Diane Larsen-Freeman and Tom Schoenemann. 2009. Language Is a Complex Adaptive System: Position Paper. *Language Learning* 59(1). Malden, USA. 1–26.
- Bybee, Joan. 2010. *Language, usage and cognition*. Cambridge: Cambridge University Press.
- Edward Gibson, Richard Futrell, Steven P. Piantadosi, Isabelle Dautriche, Kyle Mahowald, Leon Bergen and Roger Levy. 2019. How efficiency shapes human language. *Trends in Cognitive Sciences* 23(5). 389–407.
- Fedzechkina, Maryia, Elissa Newport and Florian Jaeger. 2017. Balancing effort and information transmission during language acquisition: Evidence from word order and case marking. *Cognitive Science* 41(2). 416–446.
- Haspelmath, Martin. 2015. Ditransitive constructions. *Annual Review of Linguistics* 1. 19–41.
- Kroch, Anthony, Ann Taylor and Beatrice Santorini. 2000-. The Penn-Helsinki Parsed Corpus of Middle English (PPCME2). Department of Linguistics, University of Pennsylvania. CD-ROM, second edition, release 4 (<http://www.ling.upenn.edu/ppche/ppche-release-2016/PPCME2-RELEASE-4>).
- MacWhinney, Brian, Andrej Malchukov and Edith Moravcsik (eds.). 2014. *Competing motivations in grammar and usage*. Oxford: OUP.
- Naess, Ashild. 2007. *Prototypical transitivity*. (Typological Studies in Language). Amsterdam: John Benjamins Publishing Company.
- Newman, John. 1998. Recipients and ‘give’ constructions. In Willy van Langendonck & William Van Belle (eds.), *The dative, Vol. 2: Theoretical and contrastive studies*, 1–28. Amsterdam: John Benjamins.
- Oostdijk, Nelleke, Martin Reynaert, Véronique Hoste and Ineke Schuurman. 2013. The Construction of a 500-Million-Word Reference Corpus of Contemporary Written Dutch. In Peter Spyns & Jan Odijk (eds.), *Essential speech and language technology for Dutch, Theory and applications of Natural Language Processing*, 219–247. Heidelberg: Springer.
- Pijpops, Dirk, Dirk Speelman, Stefan Grondelaers and Freek Van de Velde. 2018. Comparing explanations for the Complexity Principle. Evidence from argument realization. *Language and Cognition* 10(3). 514–543.
- Röthlisberger, Melanie. 2018. *The dative dataset of World Englishes*. KU Leuven.
- Steels, Luc. 2000. Language as a Complex Adaptive System. In Marc Schoenauer, Kalyanmoy Deb, Günter Rudolph, Xin Yao, Evelyne Lutton, Juan Julian Merelo & Hans-Paul Schwefel (eds.), *Proceedings of PPSN VI: Lecture notes in Computer Science*, 17–26. Berlin: Springer.
- Tal, Shira, Kenny Smith, Jennifer Culbertson, Eitan Grossman, and Inbal Arnon. 2020. The impact of information structure on the emergence of differential object marking: An experimental study. *PsyArXiv*.
- Van de Velde, Freek. 2014. Degeneracy: the maintenance of constructional networks. In Ronny Boogaart, Timothy Coleman & Gijsbert Rutten (eds.), *Extending the scope of Construction Grammar*, vol. 1, 141–179. Berlin: Mouton de Gruyter.