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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 45(45)

Authors

Grigoroglou, Myrto

Landau, Barbara

Papafragou, Anna

et al.

Publication Date

2023

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Peer reviewed

Space in Context: Communicative factors shape spatial language

Myrto Grigoroglou (m.grigoroglou@utoronto.ca)

Department of Linguistics, University of Toronto

Anna Papafragou (anna4@sas.upenn.edu)

Department of Linguistics, University of Pennsylvania

Keywords: spatial language; semantics; pragmatics; language acquisition; gesture; topological relations; projective relations; deictics

Decades of research have revealed that spatial language is the result of a complex interplay between language-independent, *conceptual* factors and *language-specific* forces (e.g., Bowerman, 1996; Johnston & Slobin, 1979; Landau & Jackendoff, 1993; Levinson & Meira 2003; Levinson & Wilkins, 2006). However, currently, a growing body of research acknowledges the importance of a further, much less explored but highly important factor having to do with *pragmatic* pressures – the general communicative need to convey informative meanings with appropriate levels of required effort (Grice, 1975; Zipf, 1949).

This symposium aims to present research documenting the effect of communicative/pragmatic pressures on how spatial language systems are organized, used by speakers of different languages and acquired during development. The contributed papers explore a variety of spatial language phenomena, across many different languages, using a variety of empirical methods and diverse populations of participants. Specifically, the first paper investigates how pragmatic pressures interact with spatial language semantics to affect the distribution of containment (*in/out*) and support (*on/off*) adpositions in the speech of child and adult speakers of English and three additional languages. The second paper explores how Turkish children's use of multimodal communication (gestures to convey spatial relations) contributes to the informativeness of spatial messages. The third paper uses computational methods to uncover how communicative pressures shape the specificity of topological spatial markers across 1200+ languages. The fourth paper presents a series of experiments examining the use of spatial demonstratives (*this/that*) in English and 29 additional languages.

The current approaches highlight how communicative/pragmatic pressures interact with conceptual and language-specific forces to shape the nature, use and acquisition of spatial vocabularies across languages and enhance our understanding of language use in context.

The Ins and Outs of Spatial Language

Myrto Grigoroglou, Barbara Landau, Anna Papafragou

Research on the language of space has uncovered a complex set of conceptual and linguistic factors affecting the nature,

use and acquisition of spatial vocabularies across languages. Here we highlight the important but understudied role of *pragmatic* factors in how spatial relations are encoded across ages and languages. We focus on Containment (*in/out*) and Support (*on/off*) terms that can denote both static locations ('places': *be in/out of X*) and dynamic motions ('paths': *go in/out of X*). We offer a new pragmatic analysis of place-denoting *out/off* as 'negative' locatives and, as a result, predict that such expressions should have a restricted informational contribution (and use) compared to *in/on*. This prediction is confirmed in four experiments. In elicited production tasks with English-speaking adults and three-year-olds, *out* and *off* (unlike *in* and *on*) are used extremely sparsely to describe static locations but quite frequently to describe dynamic motions. When contextual support is present, the use of place-denoting *out/off* increases. Similar patterns in the use of locatives are found in French, Greek and Turkish speakers. We conclude that pragmatic factors produce striking, early emerging and cross-linguistically stable properties of spatial vocabulary.

Development of informative spatial expressions in speech and gesture

Ercenur Ünal, Kevser Kırbışoğlu, Dilay Z. Karadöller, Beyza Sümer, Aslı Özyürek

Children learn to communicate about Front-Behind earlier than Left-Right (Johnston & Slobin, 1979). This has been attributed to the differences in the complexity of the relations (Clark, 1973). Nevertheless, when children's gestures are taken into account, their expressions about Left-Right relations are also informative (Karadöller et al., 2022). Here, we ask whether such expressions with gesture are sensitive to the complexity of spatial relations or reflect a general tendency in children. Twenty-four 8-year-old and 23 adult Turkish-speakers described four-picture displays where the target picture depicted either a Front-Behind or Left-Right relation. Children were more likely to use descriptions that become informative with gesture for Left-Right than for Front-Behind. Adults were already informative in speech and this did not change across relations. Furthermore, when gesture was considered, children were adult-like for Front-Behind but not for Left-Right. These findings suggest that cognitive development and visual modality of expressions interact in shaping spatial language acquisition.

The typology of topological spatial language: a parallel corpus study in 1200+ languages

Barend Beekhuizen

Languages show constrained variation in how they lexically group topological spatial relations (Levinson & Meira, 2003; Feist, 2008), which has mostly been studied through semantic elicitation. Here, I will show how massively parallel corpora and computational techniques can be successfully applied. Automatically extracting spatial markers from Bible translations in 1200+ languages, I first consider (1) whether ‘containment’ and ‘support’ have a single expression in a general locative marker (Feist, 2008) and (2) whether static locations are distinguished from dynamic (goal) locations (Narasimhan & Brown, 2009).

While confirming previous findings, my approach also leads to novel insights, for instance, that general locative markers are much more prevalent than the focus in the literature suggests. Such ‘lumping’ systems often have more marked counterparts expressing a narrower range of spatial relations, raising further questions whether languages vary in the division of pragmatic labour between general and specific markers. I will show how neo-Gricean heuristics (Levinson, 2000) account for the patterns of cross-linguistic variation in the pragmatic division of labour.

Spatial demonstrative systems within and between languages

Kenny R. Coventry, Piotr J. Barc, Lucy-Amber Roberts, Harmen B. Gudde

Spatial demonstratives (e.g. *this*, *that* in English) are present in all languages and are among the earliest words children use (see Diessel & Coventry, 2020 for a review). Such terms frequently occur with pointing gestures and eye gaze, and in some languages it has been claimed that pointing is obligatory when using such terms (e.g. *Gomai*, Hellwig, 2003; *Yucatec*, Bohnemeyer, 2018). Here we present the results of a programme of experiments examining spatial demonstrative use between and within languages. We first overview the results of a recent large-scale experimental study across 29 diverse languages, showing that there is significant variation in how demonstratives are used within languages, as well as both commonalities and variation between languages. We then present the results of a series of studies using the ‘memory game’ paradigm (see Coventry et al., 2014), examining variability within a language (English) by manipulating the size of the space in which objects being referred to are placed, whether participants use demonstratives explicitly or implicitly during spatial reference, and whether participants gesture or not when using demonstratives. Together these studies reveal new findings regarding the origins of variation within languages and across spatial contexts, beginning to unpack the role of environment, gesture and explicitness/implicitness on deictic communication.

References

- Bohnemeyer, J. (2018). Yucatec demonstratives in interaction: Spontaneous versus elicited data. In S.C. Levinson et al. (Eds.), *Demonstratives in cross-linguistic perspective*. Cambridge: Cambridge University Press.
- Bowerman, M. (1996). Learning how to structure space for language: A crosslinguistic perspective. In P. Bloom, M. A. Peterson, L. Nadel, & M. F. Garrett (Eds.), *Language and space* (pp. 385-436). Cambridge, MA: MIT press.
- Clark, E. V. (1973). Non-linguistic strategies and the acquisition of word meanings. *Cognition*, 2(2), 161-182.
- Coventry, K. R., Griffiths, D., Hamilton, C. J. (2014). Spatial demonstratives and perceptual space: Describing and remembering object location. *Cog. Psych.*, 69, 46-70.
- Diessel, H., Coventry, K. R. (2020). Demonstratives in spatial language and social interaction: An interdisciplinary review. In H. Diessel et al., *Demonstratives, Deictic Pointing and the Conceptualization of Space*. Frontiers in Language: Language Sciences e-book.
- Feist, M. I. (2008). Space between languages. *Cognitive Science*, 32(7), 1177-1199.
- Grice, H., P. (1975). Logic and conversation. In P. Cole and J. L. Morgan (Eds.), *Syntax and semantics: Speech acts*, (Vol. 3, pp. 41–58). New York, NY: Academic Press.
- Hellwig, B. (2003). The grammatical coding of postural semantics in Goemai (a West Chadic language of Nigeria). PhD Thesis, Radboud University, Nijmegen.
- Johnston, J. R., & Slobin, D. I. (1979). The development of locative expressions in English, Italian, Serbo-Croatian and Turkish. *JCL*, 6(3), 529-545.
- Karadöller, D. Z., Sümer, B., Ünal, E., & Özyürek, A. (2022). Sign advantage: Both children and adults’ spatial expressions in sign are more informative than those in speech and gestures combined. *JCL*, 1-27.
- Landau, B., & Jackendoff, R. (1993). “What” and “where” in spatial language and spatial cognition. *Behavioral and Brain Sciences*, 16(2), 217–238.
- Levinson, S. C. (2000). H. P. Grice on location on Rossel Island. Proceedings of the 25th Annual Meeting of the Berkeley Linguistic Society (pp. 210–224). Berkeley, CA: Berkeley Linguistics Society.
- Levinson, S. C., & Meira, S. (2003). “Natural Concepts” in the spatial topological domain – Adpositional meanings in crosslinguistic perspective: An exercise in semantic typology. *Language*, 79(3), 485–516.
- Levinson, S. C., & Wilkins, D. P. (Eds.). (2006). *Grammars of Space: Explorations in Cognitive Diversity*. Cambridge, UK: Cambridge University Press.
- Narasimhan, B., & Brown, P. (2009). Getting the inside story: learning to talk about containment in Tzeltal and Hindi. In V. C. Mueller-Gathercole (Ed.), *Routes to language: studies in honor of Melissa Bowerman* (pp. 97–132). New York, NY: Psychology Press.
- Zipf, G. K. (1949). Human behavior and the principle of least effort. Cambridge, MA: Addison Wesley Press.