Modeling landscape concepts using sensorimotor and emotional norms

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Although cognitive linguists have focused extensively on spatial language and cognition (e.g. Lakoff, 1987; Levinson, 2003; Talmy, 2000), there has been relatively little work on conceptualisations of landscape. However, people's interactions with landscape elements such as forests are essential to human life and how landscape elements are conceptualised in different communities is an emerging research area (see e.g. Burenhult et al., 2017; Burenhult & Levinson, 2008). Investigating conceptualisations of landscape is of applied relevance, too. International policy schemes such as the EU landscape convention and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services aim at describing and understanding culturally dependent conceptualisations of landscape (Council of Europe 2000; IPBES 2022). Cognitive linguistics has a critical role to play in this endeavour: It is unknown whether landscape concepts are largely shared across communities or whether they are largely a matter of linguistic convention.

We assessed landscape concepts in the Indo-European languages English, French and German with a participatory research design using online surveys. Since the conceptual system is grounded in perceptual, motor, and affective systems (e.g. Barsalou, 1999; Connell, 2019), we asked participants to rate landscape terms for their sensorimotor (Lynott et al. 2020) and emotional (Warriner, Kuperman & Brysbaert 2013) associations. We hypothesized that even for these three closely related languages, participants would differ in their conceptualisations of landscape.

As stimuli for the surveys we selected the most frequently mentioned landscape terms from a free-listing task by Van Putten et al. (2020). 279 Participants rated 74 landscape terms such as *mountain* in their first language, using scales ranging from 0 (not at all) to 5 (greatly). For sensory associations, people were asked: "to what extent do you experience MOUNTAIN by feeling through touch/ by tasting/ by smelling/ by sensations inside your body/ by hearing/ by seeing?" For motor action, we asked to what extent they experienced the term with the foot/leg, hand/arm, head, mouth, and torso. For emotions, participants used three scales from 0 to 5 which represented the dimensions calm to exciting, unhappy to happy and in control to controlled.

Using non-parametrical manova, we found cross-linguistic differences in ratings for 51 out of 74 analysed landscape concepts which confirms that English, French and German speakers conceptualise landscape differently. To further analyse the conceptual structure, we calculated cosine distance values between the ratings of landscape concepts in each language for sensorimotor and emotional rating domains. The results indicate that participants in all speaker communities distinguished the concepts based on similar criteria. Their ratings seem to differ between tranquil, engaging and potentially dangerous concepts for the emotional domain and between abstract and tangible, experienceable concepts. In a second study participants will be asked to rate landscape images instead to compare conceptualisations of linguistic and non-linguistic stimuli.

References

Alice, Gaby, Bill Palmer, Jonathon Lum & Jonathan Schlossberg (eds.). 2022. Sociotopography. *Linguistics Vanguard* 8(s1). i–203.

Barsalou, Lawrence W. 1999. Perceptual symbol systems. *Behavioral and brain sciences*. Cambridge University Press 22(4). 577–660.

Burenhult, N., C. Hill, J. Huber, S. van Putten, K. Rybka & L. San Roque. 2017. Forests: the cross-linguistic perspective. *Geographica Helvetica* 72(4). 455–464.

Burenhult, Niclas & Stephen C Levinson. 2008. Language and landscape: a cross-linguistic perspective. *Language Sciences*. Elsevier 30(2–3). 135–150.

Connell, Louise. 2019. What have labels ever done for us? The linguistic shortcut in conceptual processing. *Language, Cognition and Neuroscience*. Routledge 34(10). 1308–1318.

Council of Europe. 2000. European Landscape Convention. Report and Convention Florence, ETS No. 176.

IPBES. 2022. Summary for policymakers of the methodological assessment of the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Zenodo.

Lakoff, George. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. Chicago: University of Chicago Press.

Levinson, Stephen C. 2003. *Space in Language and Cognition: Explorations in Cognitive Diversity* (Language, Culture & Cognition). Cambridge: Cambridge University Press.

Lynott, Dermot, Louise Connell, Marc Brysbaert, James Brand & James Carney. 2020. The Lancaster Sensorimotor Norms: multidimensional measures of perceptual and action strength for 40,000 English words. *Behavior Research Methods*. Springer 52(3). 1271–1291.

Mark, David M. & Andrew G. Turk. 2003. Landscape Categories in Yindjibarndi: Ontology, Environment, and Language. In Walter Kuhn, Michael F. Worboys & Sabine Timpf (eds.), *Spatial Information Theory. Foundations of Geographic Information Science*, 28–45. Berlin, Heidelberg: Springer Berlin Heidelberg.

Palmer, Bill, Jonathon Lum, Jonathan Schlossberg & Alice Gaby. 2017. How does the environment shape spatial language? Evidence for sociotopography. *Linguistic Typology*. De Gruyter Mouton 21(3). 457–491.

Talmy, Leonard. 2000. *Towards a Cognitive Semantics*. Cambridge, Mass.: MIT Press.

Turk, Andrew. 2016. A phenomenological approach to trans-disciplinary understanding of landscape as place. In *Proceedings of the landscape values: Place and praxis conference, Centre for Landscape Studies, National University of Ireland, Galway; from 29th June to 2nd July*, 369–374.

Van Putten, Saskia, Carolyn O'Meara, Flurina Wartmann, Joanne Yager, Julia Villette, Claudia Mazzuca, Claudia Bieling, Niclas Burenhult, Ross Purves & Asifa Majid. 2020. Conceptualisations of landscape differ across European languages. *Plos one*. Public Library of Science San Francisco, CA USA 15(10). e0239858.

Warriner, Amy Beth, Victor Kuperman & Marc Brysbaert. 2013. Norms of valence, arousal, and dominance for 13,915 English lemmas. *Behavior research methods*. Springer 45(4). 1191–1207.