

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

The Fundamental Flexibility of Abstract Words

Permalink

<https://escholarship.org/uc/item/1vk753xf>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 46(0)

Authors

RfÖczaszek-Leonardi, Joanna

Borghi, Anna

Chater, Nick

et al.

Publication Date

2024

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

The Fundamental Flexibility of Abstract Words

Joanna Rączaszek-Leonardi¹ (raczasze@psych.uw.edu.pl), Anna M. Borghi^{2,3}, Nick Chater⁴, Morten H. Christiansen^{5,6}, Angelo Mattia Gervasi², Chiara Fini², Dedre Gentner⁷, Dan King⁷, Francesco Mannella³, Claudia Mazzuca², Luca Tummolini³, Julian Zubek,^{1,3}

¹Faculty of Psychology, University of Warsaw, Poland, ²Sapienza University of Rome, Italy, ³Institute of Cognitive Sciences and Technologies, National Research Council of Italy, ⁴Behavioural Science Group, Warwick Business School, UK, ⁵Department of Psychology, Cornell University, ⁶School of Communication and Culture, Aarhus University, Denmark, ⁷Department of Psychology, Northwestern University, USA

Keywords: language theory; abstraction; abstract words; abstract concepts; relational properties; social interaction; computational modeling

Introduction

In this Symposium we link different perspectives and traditions of research on language and concepts in the cognitive sciences to better understand the process of abstraction from the social-interactive standpoint. In contrast to the usual benefits of abstraction – such as the ability to categorize and generalize – we underscore the possibility of abstract concepts and words to remain underspecified, “open to the context, the suggestions of others” (Borghi, 2023) or to processes of real-time negotiations (Christiansen & Chater, 2022). This is enabled by their largely non-perceptual relational character (Gentner, 2005) and by the fact that they arise in cognitive systems continually embedded and active in their environments (Cisek 1999; Mannella & Tummolini 2023).

Our goal is to understand how such flexible structures function in individual cognition, scaffolded by and scaled-up in social-communicative processes and stabilized in language evolution. We turn to experimental work on abstraction as rooted in analogical comparison processes (Gentner & King) to understand the relational nature of concepts, which may involve social-world dependencies and where analogies are often provided by social partners. To better understand the putative mechanisms, we enlist ecologically-sensitive computational models of abstract concepts arising in situated interaction and apply them to the case of demonstratives (Tummolini, Gervasi, Mannella and Zubek). Further, we ask if additional mechanisms (such as social metacognition) could be posed to account for dealing with the indeterminacy of meaning of abstract words (Borgi, Fini, Mazzuca) and specify the socio-cultural trajectories for arriving at more specific meanings. The recent conception of language as charades demonstrates how the complex metaphorical generalizations carry understanding across contexts, building on shared experiences and opening novel ways for coordination (Christiansen & Chater).

With this Symposium we hope to foreground the view of language as a context-sensitive regulator of human relations (Rączaszek-Leonardi & Zubek, 2023), which clashes with the prevailing view of language as a carrier of definite meanings. The closing discussion will be devoted, among other issues, to the possibility of developing a framework, which would encompass these phenomena.

Symposium Contributions

Anna Borghi, Chiara Fini & Claudia Mazzuca

Abstract words, indeterminacy, and social interaction

Abstract concepts and words (e.g., "freedom") are interesting because we use them extensively and they exemplify the malleable, flexible, and negotiable character of all words. In the presentation, we will propose and discuss a view of abstract concepts based on social interaction. We will argue that social interaction is more crucial for abstract than concrete concepts, independent of their specific content. During abstract concept acquisition, people especially need the support of others who can help them form categories of members that are not perceptually similar. Once abstract words have been acquired, their indeterminate meaning can lead to debates among people, and often, reaching a common understanding of their meaning requires some effort. In this context, we will describe a process we call social metacognition – people monitor their knowledge, are more uncertain and less confident about the word's meaning, and rely on others' knowledge more in the case of abstract than in the case of concrete concepts. This view introduces a distinction between two kinds of abstract concepts. Some abstract concepts, even if acquired through social interaction and flexible, might progressively assume a well-defined character and have some stability within a given culture; it is the case of some conventional concepts referring to time and magnitude, such as "month." In contrast, the meaning of other abstract concepts, such as "truth," remains indeterminate and vague. This distinction within abstract concepts might lead to rereading current evidence and formulating new predictions.

Dedre Gentner & Dan King

How do abstract meanings arise?

Many of our abstract concepts have their origins in concrete domains. For example, *sanctuary* once meant a house of worship, but now it can encompass any situation in which a person feels safe (e.g., ‘Her work is a sanctuary’). How do these abstract concepts come about—what are the processes that lead to abstraction?

We suggest that abstract word meanings are acquired largely through analogical comparison processes. Analogical comparison engages a process of structure-mapping that highlights commonalities, especially relational commonalities. Because of the bias to find common relational

systems, this process naturally tends to promote relational abstractions. For example people asked to interpret “Cigarettes are time bombs” say things like “Both do their damage after a long period in which no damage is seen” With repeated usage, these interpretations can become established word senses. Many of these new senses will be abstract relational meanings. With further usage, they may even supplant the original concrete meaning: e.g., “phlegmatic” is now taken to describe a temperament, not a bodily humor.

This process of analogical abstraction is especially active in verb interpretation. For example, the verb “limped” generally refers to walking in an impaired way; but it readily alters its meaning to adapt to its context. Asked to paraphrase “The wagon limped”, people jettison the idea of motion by means of legs, and say things like “The cart rolled jerkily up the hill.” Given “The sermon limped”, the paraphrases are still more abstract—e.g., “The message was not very persuasive” or “The ideas were received unevenly.” Three findings from this work are (1) In cases of semantic strain, verbs change more than nouns; (2) Verb meaning change is finely calibrated to the noun context (minimal subtraction); and (3) This process occurs via a structure-mapping between the verb and the event normally associated with the noun. Implications for language evolution are discussed.

Luca Tummolini, Angelo Mattia Gervasi, Francesco Mannella & Julian Zubek

Demonstrative semantics is contextual, abstract and grounded

Words like “this” and “that” are linguistic expressions that are often used to coordinate attention on a physical referent. Being part of a deictic system, their context-sensitive nature is not disputed but it is still unclear which are the contextual parameters that are exploited in communication. In the standard view, demonstrative meaning encodes a contrast between two spatial relations: the referent being “near the speaker” (the proximal “this”) or “far from the speaker” (the distal “that”). Recently, this view has received experimental support by being linked to the perceptual representation of peripersonal, reaching space and extrapersonal, out-of-reach space. Here we challenge the spatial view and propose that demonstrative meaning is in fact more flexible and abstract than previously implied. We propose that the linguistic contrast maps onto a more abstract understanding of agency relations, and in particular onto a contrast between the speaker being (or not) in physical control of the referent. While reachability is a case of physical control by bodily contact with the referent, we propose that the meaning of demonstratives is similarly influenced by distal control of events that are beyond bodily interaction. We offer experimental evidence to show that physical control by the speaker influences demonstrative use even when bodily contact with the referent is not relevant. Finally, we illustrate with a computational architecture how abstract concepts of controllability might be acquired while preserving their groundedness.

Morten H. Christiansen & Nick Chater

Language as charades

A long philosophical tradition supposes that words express concepts, which then map onto categories in the external world. But does this story really fit with the pragmatics of communication? In the game of charades, people use ad hoc movements and gestures to convey songs, books, or movie titles using shared background knowledge, and shared imagination with the audience. In charades, the challenge is to solve the communicative problem of the moment: if a particular chest-beating gesture is enough to trigger thoughts of apes and gorillas, this may, in a particular context, be enough to pick out “King Kong.” In a later charade, the same gesture might be reused to help convey “Gorillas in the mist” or even “The Monkees.” Over time, recycled gestures become simpler and more stylised; and their likely communicative significance may become more entrenched, although always flexible. We argue that the game of charades provides a microcosm of the origin and use of language, and one that clashes with classical philosophical perspectives. Communicative signals (including words) gain their significance in specific contexts and through continual metaphorical generalizations across contexts. There is no meaningful answer to the question of what concept the chest beating gesture expresses or the category in the world to which it corresponds. We show that the same is true for words, both concrete and abstract.

Acknowledgments

This project has received funding from EU Horizon2020 Twinning Trainee, agreement No 952324; PNRR funds, PE8 - AGE-IT - Spoke 4: Healthy aging, Research line on concepts; PRIN funds, WHIM Contract No. 2022LYRT8E.

References

- Borghi, A.M. (2023). *The Freedom of Words. Abstractness and the Power of Language*. Cambridge University Press.
- Christiansen, M. H. & Chater, N. (2022). *The Language Game: How Improvisation Created Language and Changed the World*. Basic Books.
- Cisek, P. (1999). Beyond the computer metaphor: Behaviour as interaction. *Journal of Consciousness Studies*, 6(11-12), 125-142.
- Gentner, D. (2005). The development of relational category knowledge. In L. Gershkoff-Stowe, D. H. Rakison (Eds.), *Building object categories in developmental time*. pp. 245–275. Lawrence Erlbaum Associates.
- Mannella, F., & Tummolini, L. (2023). Kick-starting concept formation with intrinsically motivated learning: the grounding by competence acquisition hypothesis. *Philosophical Transactions of the Royal Society B*, 378(1870), 20210370.
- Rączaszek-Leonardi, J., Zubek, J. (2023). Is love an abstract concept? A view on concepts from an interaction-based perspective. *Philosophical Transactions of the Royal Society B* 378, 20210356.