

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Universal Languages of Thought: LoT is a topos

Permalink

<https://escholarship.org/uc/item/1v1014v8>

Journal

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

Author

Phillips, Steven

Publication Date

2023

Peer reviewed

Universal Languages of Thought: LoT is a topos

Steven Phillips

National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki, Japan

Abstract

The Language of Thought (LoT) hypothesis says that (some) mental abilities have a compositional syntax/semantics akin to language (i.e. a symbol system), in particular, to account for the systematicity and productivity of thought. Yet, this hypothesis raises two questions. (1) Why should thought be that way? (2) How does LoT connect to non-symbolic (spatial) aspects of cognition? Category (Topos) theory is introduced to sketch out answers to both questions, whereby mental representation is regarded as a functor and mental process as a natural transformation. Individual features of a LoT follow from (categorical) universal constructions that collectively constitute a topos, whence the slogan, "LoT is a topos", and topos theory lies at the nexus of algebra, geometry and logic (cf. language, perception and reasoning). This view suggests that LoT is a kind of "optimal" construction, i.e. the best one can do in the given context.