

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

What Language Reveals about Perception: Distilling Psychophysical Knowledge from Large Language Models

Permalink

<https://escholarship.org/uc/item/6dk5q565>

Journal

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

Authors

Marjeh, Raja
Sucholutsky, Ilia
van Rijn, Pol
et al.

Publication Date

2023

Peer reviewed

What Language Reveals about Perception: Distilling Psychophysical Knowledge from Large Language Models

Raja Marjieh

Princeton University, Princeton, New Jersey, United States

Ilia Sucholutsky

Princeton University, Princeton, New Jersey, United States

Pol van Rijn

Max Planck Institute for Empirical Aesthetics, Frankfurt am Main, Hesse, Germany

Nori Jacoby

Max Planck Institute for Empirical Aesthetics, Frankfurt, Deutschland, Germany

Tom Griffiths

Princeton University, Princeton, New Jersey, United States

Abstract

Understanding the extent to which the perceptual world can be recovered from language is a fundamental problem in cognitive science. We reformulate this problem as that of distilling psychophysical information from text and show how this can be done by combining large language models (LLMs) with a classic psychophysical method based on similarity judgments. Specifically, we use the prompt completion functionality of GPT3, a state-of-the-art LLM, to elicit similarity scores between stimuli and then apply multidimensional scaling to uncover their underlying psychological space. We test our approach on six perceptual domains and show that the elicited judgments strongly correlate with human data and successfully recover well-known psychophysical structures such as the color wheel and pitch spiral. We also explore meaningful divergences between LLM and human representations. Our work showcases how combining state-of-the-art machine models with well-known cognitive paradigms can shed new light on fundamental questions in perception and language research.