Workshop on Language, Thought, Structure

DATE 17 September 2025

VENUE Buncomo Basement Multi-purpose Room
Faculty of Letters, Kyoto University
京都大学文学部　ぶんこも多目的スペース

NO Registration Required

10:00-11:00	Rethinking the Data of Generative Grammar: A Model-Based Approach	Taisei Chujo Kyoto University
11:00-11:10	Short Break	
11:10-12:10	Productivity Without Compositionality A Group Theoretic Account	Soto Michida Kyoto University
12:10-13:30	Lunch Meeting	
13:30-14:30	Language Models, Alien Structure, and the Alignment of Values	Ryan Nefdt University of Cape Town University of Bristol
14:30-14:40	Short Break	
14:40-15:40	Algebraic and Geometric Structures of Concepts	Jun Otsuka Zen University

Organizer

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Rethinking the Data of Generative Grammar: A Model-Based Approach — Taisei Chujo

"Acceptability judgments" as data in generative grammar have long faced scrutiny regarding their scientific validity due to the informality of their collection methods, such as subjectivity and reliance on n=1 samples. However, recent re-examinations by Experimental Syntax have revealed the surprising reproducibility and robustness of this traditional data, posing a new question: Why can seemingly subjective data satisfy the scientific demands of objectivity and reproducibility?

This presentation argues that the key lies in the concept of a "data model," which mediates between theory and observation. What the theory of generative grammar truly accounts for is not the individual judgment itself, but the contrast between judgments, skillfully constructed to test a specific grammatical hypothesis. This contrastive structure is precisely the data model that constitutes the linguistic phenomenon the theory aims to explain. Furthermore, the individual judgments that constitute this model are not "raw data" (i.e., completely objective facts), but are highly theory-laden data, presupposing the theoretical construct of an idealized speaker-hearer. This presentation reframes the debated subjectivity of acceptability judgments as an inherent and necessary property of the process of constructing a data model.

Productivity Without Compositionality: A Group Theoretic Account — Soto Michida

A distinctive feature of language is its productivity: competent speakers can generate and understand an indefinitely large number of novel expressions. Productivity has, since Gottlob Frege, been explained primarily through the principle of compositionality, which has therefore occupied a foundational place in both philosophy of language and linguistics. Nevertheless, it remains contested whether natural language semantics is, or ought to be, compositional. It is also debated whether compositionality is truly indispensable for explaining productivity.

This talk argues that compositionality is sufficient but not necessary for explaining productivity. The key move is to draw on Ruth Millikan's notion of *isomorphism*, which I formalize as a group homomorphism—a structure-preserving mapping between transformations in the environment and in a system of signs. I demonstrate that, on this account, productivity can be secured without presupposing the principle of compositionality, thereby providing a robust alternative to Fregean semantics.

Finally, and as a side note, I would like to mention George Berkeley's theory of vision as a historical precedent for this Millikanian conception of productivity.

Language Models, Alien Structure, and the Alignment of Values — Ryan Nefdt

In this talk, I present the serious possibility that large language models employ an *alien* representational structure (Pelletier & Nefdt 2025, Cappelen & Dever 2025). There are many routes into this possibility. The first, I call 'Kantian' involves a hidden noumenal world within our data structures accessible only to certain kinds of stochastic machines. The second route, what I call 'Complexity', suggests that alien structure is just more complex human structure (possibly superintelligence), a difference in degree not kind. The third, what I call 'autoprompt' involves a kind of linguistic relativity in which LLMs are genuinely 'speaking' a different language but not untranslatable or incommensurable in principle.

In the rest of the talk, I focus on the issue of value alignment between humans and AI in terms of whether a natural human language can capture the features or 'describe' (in the sense of Eklund 2024) the possible alien structure of AI. I evaluate the potential for value alignment for each possible account of alien structure and argue that only one particular case (Kantian) it is impossible. Finally, I suggest some practical strategies to ensure that we are developing technology in line with the other more 'human-friendly' cases of alien structure.

Algebraic and Geometric Structures of Concepts — Jun Otsuka

This talk presents formal models for two classical understandings of concepts—Aristotelian Abstractionism and the Wittgensteinian Similarity view—and explores their connection. Abstractionism views concepts as forming a nested hierarchy characterized by inclusion relationships (e.g., Human is an Animal). This conceptual hierarchy is formally modeled as a complete lattice, with the "is-a" relationship serving as its partial order. In contrast, the similarity view treats concepts as clusters of similar objects. These regions in conceptual space can be understood as submanifolds in a metric space, as described by the Manifold hypothesis in machine learning literature. In both approaches, the key insight is that possible concepts are constrained by specific functional relationships—either lattice homomorphisms or smooth functions.

One of the biggest challenges in AI interpretability today is extracting human-understandable knowledge from machine representations geometrically embedded in the latent space of deep neural networks. In our framework, this task involves building a concept lattice from conceptual manifolds. In the final part of the talk, I examine various approaches to this challenge and the conceptual difficulties they encounter.