

Categories in Logic, Linguistics, and Sociology

Abstracts

February 20–22

1 Tuesday 20

1.1 Michael Moortgat, Utrecht University 9:00–10:00 Categories in Formal and Distributional Semantics

The ‘Syntactic Calculus’ introduced by Lambek in 1958, 1961 is a precursor of the ‘parsing as deduction’ method in computational linguistics: the conventional linguistic categories are turned into formulas of a grammar logic; the judgement whether a phrase is syntactically well-formed is the outcome of a process of deduction. Present-day categorial grammars extend Lambek’s formula language with operations that allow controlled forms of reordering and restructuring; with these tools, the grammar logic can accommodate cross-linguistic variation. In this talk, I compare two ways of associating syntactic derivations with a compositional interpretation: the formal semantics approach as one finds it in the tradition of Montague grammar, and the vector-based, distributional approach. They both are based on a homomorphic translation that sends types and proofs of the syntax to their counterparts in an appropriate semantic algebra. In the case of formal semantics, meaning composition is expressed in terms of the (linear) lambda calculus and its interpretation; in the distributional case, semantic modelling is in terms of finite-dimensional vector spaces and linear maps. As it turns out, the two approaches face very similar challenges when it comes to the division of labour between lexical and derivational semantics.

1.2 Dick de Jongh, University of Amsterdam 10:15–11:15 Subintuitionistic Logics

The talk will be a report on work together with Fateme Shirmohammadzade Maleki on subintuitionistic logics arising by weakening the implication of IPC. With Kripke models such subintuitionistic logics have been studied since 1987, first by Giovanna Corsi, later by Albert Visser, Greg Restall and others. I will introduce these logics and the results we obtained on them such as conservativity results of IPC over some of these logics. Then I will discuss still weaker logics introduced by us which have two different kinds of neighbourhood semantics. For both kinds of logics I will discuss translations into modal logic.

1.3 Giuseppe Greco, Utrecht University 11:30–12:30 Lattice Logic Properly Displayed

The present talk reports on recent work in which a proper (multi-type) display calculus is introduced for the logic of (non-distributive) lattices which is sound, complete, conservative, and enjoys cut-elimination and sub-formula property. Properness (i.e., closure under uniform substitution of all parametric parts in rules) is the main interest and added value of the proposal, and allows for the smoothest Belnap-style proof of cut-elimination. The proposal builds on an algebraic and order-theoretic analysis of the semantic environment of lattice logic, and applies the guidelines of the multi-type methodology in the design of display calculi.

1.4 Arnout van de Rijt, Utrecht University 14:00–15:00
Cumulative Advantage

The sociological theory of cumulative advantage claims that positive feedback operating on small, arbitrary advantages can with time produce an ever widening gap between winners and losers. Cumulative advantage is of interest to sociologists as a process through which social inequalities can endogenously form. Cumulative advantage is thought to undermine meritocracy by generating arbitrary differentiation between equally able individuals as it would allow a lucky scientist/artist or start-up company to perpetuate an initial success advantage over an initially unlucky but qualitatively superior peer. I overview my recent work on the topic.

1.5 Rens Dimmendaal, University of Amsterdam 15:15–15:45
Similarity, Hierarchy, and Validation of Estimated Semantic Spaces

Research on categories regularly requires the estimation of a semantic space, which quantitatively represents how the audience makes sense of a domain. However, these estimates are often based on implicit assumptions, and the quality of these estimated spaces are rarely validated. In this talk I will: (a) illustrate the need for validation of estimated semantic spaces empirically in the domain of books, (b) introduce a theoretically motivated basis validation method for estimated semantic spaces, and (c) show the importance of accounting for latent hierarchy when estimating a semantic space.

2 Wednesday 21

2.1 Willem Conradie, University of the Witwatersrand 9:00–10:00

2.2 Minghui Ma, Sun Yat-sen University 10:15–11:15
Finite Model Property of Pretransitive Modal Logic

A possible solution to the long-standing open problem of the finite model property of the pretransitive modal logic $K(2, 3) = K + \Box\Box p \rightarrow \Box\Box\Box p$ is proposed. This modal logic is conservatively extended to the tense logic $Kt(2, 3)$. We propose a proof of the finite model property of $Kt(2, 3)$ which derives the finite model property of $K(2, 3)$. The proof proceeds by showing the finite model property of a Gentzen sequent calculus G for $Kt(2, 3)$ which admits cut elimination, and a construction of finite syntactic model is used.

2.3 Alessandra Palmigiano, Delft University of Technology 11:30–12:30
Interrogative Agendas and Deliberations: A Multi-Type Approach

2.4 Alex van Venrooij, University of Amsterdam 14:00–15:00
Category Emergence in Cultural Fields

How do new categorical systems emerge and develop over time? In this talk I draw upon institutional and ecological theories of category emergence to understand the development of the UK field of electronic/dance music. First, using data from an online discography of electronic/dance music records and a historical digital archive of music magazines, I study the ‘emergent phase’ of the field and analyze how the legitimating activities of the UK media industries ‘anchored’ the emerging definition of the category of electronic/dance music in a selection of exemplary acts that fitted a ‘place-based’ cultural narrative. Second, I show how this selection of cultural anchors further spawned a number of new categories, and test whether ecological mechanisms can predict the timing of emergence of these new genres. Both cross-genre legitimacy and competition mechanisms are found to influence the chances of category emergence in the field of electronic/dance music.

2.5 Jan de Groot, University of Amsterdam 15:15–15:45
Work-Related Categories and Cultural Consumption

3 Thursday 22

3.1 Nachoem M. Wijnberg, University of Amsterdam 14:00–14:45

3.2 Michael T. Hannan, Stanford University 14:45–15:45
Concepts and Categories: Foundations for Sociological Analysis

This talk will sketch some of the main theoretical and modeling perspectives taken in this book manuscript. The goal of the book is to provide a unified approach to cognition that can serve as a foundation for sociological analysis. The approach is formal and probabilistic. The issues addressed in the talk are those that are most relevant to Michele Piazzai's dissertation research (which he will defend earlier in the day). The core problem is to understand the meaning of multiple categorization (objects being associated with two or more concepts in a meaningful set, what we call a cohort of concepts) and the reason why multiply categorized objects generally face a valuation penalty. Addressing this problem requires analysis of the nature of concepts and categorization. We regard concepts as probability distributions over semantic spaces, functions that tell what is expected of instances of the concepts. The probabilistic approach requires rethinking of conceptual spaces and of distances between concepts.

3.3 László Pólos, Durham University 16:00–17:00

3.4 Johannes Schmalisch, Durham University 17:15–17:45
Communicative Interactions and Label Assignments