

# Abstracts

**Peter Brössel & Nina Poth**

**Title:** On How to Learn Words and Acquire Concepts

**Abstract:** In this paper, we introduce a new account of concept acquisition and word learning that combines the very popular account of Bayesian word learning by Xu and Tenenbaum (2007) with Gärdenfors' (2000, 2014) account of conceptual representation and conceptual thought. According to Xu and Tenenbaum's Bayesian account of word learning, children learn new words as if they were perfect Bayesian agents. But how should we determine the relevant probabilities? The very rough idea of Xu and Tenenbaum is to tie these probabilities to the size of the concept that we refer to with the given word, which, according to them, roughly corresponds to the average dissimilarity of the objects falling under it. In this paper, we not only criticize Xu and Tenenbaum's proposal but we also demonstrate that Xu and Tenenbaum's approach can be made more precise and fruitful by relying on Gärdenfors's Conceptual Spaces account of conceptual representation. Based on recent work of Douven and Decock (2015), one then can show how the geometrical structure of the phenomenal space determines the relevant probabilities for learning phenomenal concepts such as BROWN, SQUARED, DARK and the corresponding words.

**Igor Douven**

**Title:** Scoring in context

**Abstract:** A number of authors have recently put forward arguments pro or contra various rules for scoring probability estimates. In doing so, they have skipped over a potentially important consideration in making such assessments, to wit, that the hypotheses whose probabilities are estimated can approximate the truth to different degrees. It is argued that taking into account closeness to truth can be of great practical significance. Once this is recognized, however, it transpires that the question of how to assess probability estimates depends heavily on context.

**Norbert Gatzl**

**Title:** A Defense of Classical Logic

**Abstract:** Classical logic is a success story. Having said this there is no lack of criticism. One major critical point is that in some formalizations of classical logic, foremost Gentzen's LK (and its kin), do have multiple conclusions. This paper consists essentially of two major building blocks: the first one is to discuss both some aspects of reasoning as formalized in classical logic and some aspects of proof-theoretic semantics instantiated by Gentzen's LK-systems. The second major building block contains (a) the propositional part and (b) a quantificational part of a single conclusion sequent calculus based on a hypersequents-extension of Gentzen's LK, coined GKS.

## **Andreas Hüttemann**

**Title:** Why Physics isn't Fundamental

**Abstract:** I argue that we have no evidence for the claim fundamental physics describes objects or structures that are fundamental in the metaphysicians' sense of fundamentality.

## **Gabriele Kern-Isberner & Christian Eichhorn**

**Title:** Conditionals – all-rounders for quantitative and qualitative logical frameworks

**Abstract:** Conditionals are fascinating objects of reasoning in nearly all domains where rational logic-based thinking is important. As plausible rules or rules with exceptions, they help us not only to manage our everyday lives successfully, but also to support a physician's diagnostic capabilities, or a scientist's findings of good hypotheses. Interpreting conditionals via two-valued material implications is often done for the sake of logical clarity but cuts off their power considerably. Conditionals are understood and dealt with much better as at least three-valued entities of knowledge or belief that encode often semantical relationships between antecedent and consequent. This expressiveness of conditionals has been well appreciated in the probabilistic environment, where conditional probabilities and Bayes' rule have been offering a rich framework for reasoning for centuries. However, counterparts of these methods in more qualitative environments are much less well known. With strong involvement of philosophers, the fields of nonmonotonic reasoning and belief revision emerged in the 80s of the last century, and here conditionals proved to be particularly useful both for encoding both nonmonotonic inferences and revision strategies, continuing their probabilistic success story in more qualitative domains. In particular researchers like Ernest Adams and Judea Pearl emphasized the role of conditionals to link qualitative and quantitative reasoning.

In this talk, we elaborate on the role of conditionals for qualitative and quantitative logical frameworks, for nonmonotonic inferences and belief revision, and in general, as an excellent belief entity that combines logical quality with semantical expressiveness and commonsense meaning. In particular, we report on computational experiments that we did together with Gerhard Schurz and Paul Thorn which are based on Gerhard Schurz's innovative work on deriving qualitative inferences from probabilistic conditionals.

## **Theo Kuipers**

**Title:** Nomic truth approximation by 'theories looking for domains', revisited

**Abstract:** The theory of nomic truth approximation (Kuipers, 2000) essentially deals with truth approximation by theory revision for a fixed domain. The formal aspects of theory revision strongly suggest an analogy between truth approximation and design research, for example, drug research. Whereas a new drug (a new theory) may be better for a certain disease (may be closer to the truth about a certain domain) than an old one. However, in drug research it also frequently occurs that a certain drug turns out to be better for another disease than for the originally targeted disease. The latter phenomenon was nicely captured by the title of a study by Rein Vos (1991): Drugs Looking for Diseases. The analogy suggests that a certain theory may be closer to the truth about another domain than to the truth about the originally targeted domain.

Indeed, variable domains can also be taken into account in dealing with truth approximation, where the main domain changes concern domain extension and domain restriction, and combinations of both. In a later paper (Kuipers, 2006) I have presented a coherent set of definitions of 'more truthlikeness', 'empirical progress' and 'truth approximation' due to a revision of the 'domain of intended applications'. This set of definitions seems to be the natural counterpart of the basic definitions of similar notions as far as theory revision is concerned.

However, my book and paper were based on theories making the strong claim that they capture precisely all nomic possibilities. In (Kuipers, online), I have presented a generalized version of nomic truth approximation by theory revision based on two-sided theories, consisting of a specific set of models and a number of postulates, respectively. They merely claim that all specific models represent some (but not necessarily all) nomic possibilities and that the postulates are necessary conditions for being a nomic possibility, but jointly they need not be sufficient. In the paper to be presented I will explore the consequences for truth approximation in the form of domain revision of such a fixed two-sided theory.

T. Kuipers (2000), *From Instrumentalism to Constructive Realism*, Dordrecht, Kluwer, 2000.

..... (2006), "Theories looking for domains. Fact or fiction?", in Lorenzo Magnani, editor, *Model-Based Reasoning in Science and Engineering*, London, College Publications, 2006. pp. 1–18

.....(online), "Models, postulates, and generalized nomic truth approximation", Synthese online. DOI 10.1007/s11229-015-0916-9

R. Vos (1991), *Drugs Looking for Diseases*, Kluwer Academic Publishers, Dordrecht, 1991.

## Hannes Leitgeb

**Title:** A New System of Hyperintensional Logic and Semantics

**Abstract:** This paper develops a new logical semantics according to which formulas are evaluated at states that may be incomplete or inconsistent, and in which the negation operator and the indicative conditional operator create hyperintensional contexts. The system shares various features with situation semantics, semantics for relevance logic, truthmaker semantics, Kripke semantics for intuitionistic logic, and recent philosophical work on content and aboutness (such as by Stephen Yablo); at the same time, it also differs from each of them in some ways. We start by presenting the semantics for propositional languages and by determining the logical system that is sound and complete with respect to it: the resulting logic turns out to contain both first-degree-entailment and intuitionistic logic as subsystems. In the second part I will show that the hyperintensions that are expressed by formulas in the semantics allow for very intuitive presentations and match formal structures that have been studied independently by mathematicians in areas such as optimization theory, combinatorics, and graph theory. The third part of the talk extends the semantics and logic to the language of predicate logic. In the fourth and final part of the talk I will apply the system to type-free truth and truth-theoretic paradoxes: the result may be viewed as an extension of the Strong Kleene logic version of Kripke's theory of truth to the effect that all T-biconditionals for sentences in Kripke's language are evaluated as true at all states, but where only the 'T('A')  $\rightarrow$  A' direction of the T-scheme holds for all sentences whatsoever (including perhaps the new conditional operator). The system has various further applications (such as to vagueness and the Sorites Paradox), it leads to some interesting philosophical questions about Kit Fine's recent work on exact truthmaking, and it might thus serve as a promising new candidate for a foundation for hyperintensional semantics and logic.

## **Ilkka Niiniluoto**

**Title:** Truthlikeness: Old and New Debates

**Abstract:** This paper gives a survey of old and new debates about the notion of truthlikeness. Among the topics to be discussed are the following: the roots in Academic skepticism; the refutation of Popper's definition by Hempel and Hattiangadi; attempts to rescue Popper by Schurz & Weingartner and Cevolani's Carnapian treatment; are explications needed or not; comparative vs. quantitative approaches; disjunctive vs. conjunctive approaches; matching approaches vs. geometrical distances; Clifford distance and its modifications; min-sum measure and Oddie's new defense of the average measure; Bird's random belief test; estimation of truthlikeness and Laudan's challenge.

## **Markus Schrenk**

**Title:** A History of Production and Modality

**Abstract:** Hume held that "efficacy, agency, power, force, energy, necessity, connexion, and productive quality, are [...] nearly synonymous." (Hume 1739: 157) Indeed, the transition from each member of the following cascade of statements to the next is fairly intuitive: "c produces e", "c brings about that e", "c causes e", "c necessitates e", "it is necessary that when c then e".

I am interested in the relation between the two endpoints, production and modality. I will give a couple of historical examples from the philosophy of science – laws, causation, dispositions; starting with Hume and the logical empiricists and arriving at the recent revival of metaphysics of science – where they have been treated as if they were the same thing or, at least, where they have not been explicitly distinguished.

The goal is to highlight differences which indicate that we should not identify (causal) production and modality at all. The rare examples where the two were indeed separated – for example, Armstrong's necessitation relation which is not to be confused with necessity, or the agency and transfer accounts of causation which are conceptually more on the production side than on modality – will be examined.

## **Corina Strößner**

**Title:** What can we infer from typicality?

**Abstract:** Since the 1970ies proponents of the prototype theory emphasize the importance of typicality. There is an overwhelming psychological evidence showing that categorization and conceptual processing are largely driven by typicality orderings. The talk investigates whether we can infer typicality orderings for composed and modified concepts from the typicality orderings of their components. I will introduce different formal models of typicality that give different answers to that question and present the result of experimental work carried out by our research group "Frame representation of prototype concepts and prototype-based reasoning" (Schurz, Schuster, Strößner).

**Paul Thorn**

**Title:** The Simultaneous Aggregation of Beliefs and Degrees of Belief

**Abstract:** Many past studies have considered the problem of aggregating the beliefs of a group of agents, in order to form a 'collective' belief set. Other studies have considered the related problem of aggregating degrees of belief. In this talk, I consider the problem of simultaneously aggregating beliefs and degrees of belief. It is assumed that the beliefs and degrees of belief of rational individuals, and rational collectives, satisfy a number of standard rationality constraints, including: (1) consistency and deductive closure for belief sets, (2) probabilistic coherence for degrees of belief, and (3) the Lockean Thesis concerning the relationship between belief and degree of belief (i.e., there is some lower bound  $r$  on degree of belief that is necessary and sufficient for belief). Assuming that the beliefs and degrees of belief of both individuals and collectives satisfy the preceding three constraints, I investigate what further constraints may be imposed on the aggregation of beliefs and degrees of belief. Some possibility and impossibility results are presented. The possibility results suggest that the three proposed rationality constraints are compatible with reasonable aggregation functions for belief and degree of belief.

**Ioannis Votsis**

**Title:** Testing for Theory-Ladenness: The Stimulus Exchange Procedure

**Abstract:** TBA

**Paul Weingartner**

**Title:** A kind of laudatio and a new type of knowledge

**Abstract:** My talk will be divided into two parts. 1. Laudatio, 2. New type of knowledge. In the laudatio I shall report how Gerhard became my research assistant, how we were working together and how I would characterize him as a philosopher. In the second part I shall propose a new type of knowledge. To define it I shall use two concepts of natural science in an analogous way: entropy and information. Knowledge will then be defined with the help of what I call "epistemic entropy" and "epistemic information".

**Markus Werning**

**Title:** Compositionality in a World Without Synonyms - Existence and Uniqueness of a Similarity-based Semantics

**Abstract:** TBA