11–15 September 2018, Poznań

Poznań Reasoning Week

Games and Reasoning | Logic & Cognition | Refutation Symposium

ABSTRACTS

11–15 September 2018, Poznań

About

Poznań Reasoning Week 2018 consists of three conferences, aimed at bringing together experts whose research offers a broad range of perspectives on systematic analyses of reasoning processes and their formal modelling. PRW 2018 is co-organised by the Institute of Psychology, Adam Mickiewicz University and Institute of Philosophy, University of Zielona Góra.

In 2018 we address:

- games in reasoning research (*Games and Reasoning 2018*);

- the interplay of logic and cognition (*Logic and Cognition 2018*);

- refutation systems (*Refutation Symposium 2018*).

Key-notes

Camillo Fiorentini (University of Milano)
Valentin Goranko (Stockholm University)
Gabriele Pulcini (New University of Lisbon)
Hans Tompits (Vienna University of Technology)
Heinrich Wansing (Ruhr-University Bochum)
Keith Stenning (University of Edinburgh)
Gerhard Minnameier (Goethe University Frankfurt)

Acknowledgements

https://poznanreasoningweek.wordpress.com/

Part I

Program

L&C 12th September (Wednesday)

9:30–9:50	Morning coffee & Registration
9:50–10:00	L&C opening

10:00–10:45	Orianne Bargain and Emmanuelle-Anna Dietz Saldanha, *Cognitive Principles and Dierences in Human Syllogistic Reasoning*
10:45–11:30	Yves Bouchard, *Inferential Knowledge and Knowledge Representation*

11:30–11:45	Coffee

11:45–12:45	[Key-note] Gerhard Minnameier, *The logic of abduction, deduction, and induction, and a taxonomy of inferential reasoning*

12:45–14:00	Lunch

14:00–14:45	Dominic Deckert, Emmanuelle-Anna Dietz Saldanha, Steffen Hölldobler and Sibylle Schwarz, *Human Reasoning, Computational Logic, and Ethical Decision Making*
14:45–15:30	Adrian Groza, *Distinguishing argument and explanation with description logic*

15:30–15:45	Coffee

15:45–16:30	Petr Cintula, Carles Noguera and Nicholas J.J. Smith, *The sorites paradox in mathematical fuzzy logic*
16:30–17:15	Aleksandra Czyż, Kinga Ordecka and Andrzej Gajda, *Acceptable propositional normal logic programs checking procedure implementation*

18:00	Dinner at "Makaron"

L&C 13th September (Thursday)

9:30–10:00	Morning coffee

10:00–10:45	Farshad Badie, *A Semantic Representation of Humans' Conceptions in Terminological Systems*
10:45–11:30	Paula Álvarez Merino, Carmen Requena and Francisco Salto, *Deduction as a factive hypothesis*

11:30–11:45	Coffee

11:45–12:45	[Key-note] Keith Stenning, *A logical characterisation of a human language phenotype finds a central role throughout cognition*

12:45–14:00	Lunch

14:00–14:45	Moritz Cordes, *Inferential Erotetic Logic and Cognitive Speech Acts*
14:45–15:30	Sylvie Saget, *Language as a tool: Acceptance-based Pragmatics*
15:30–16:15	Ondrej Majer, *Many-valued logics and strategic reasoning*

Deduction as a factive hypothesis

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The normative difference between deduction and induction does not imply that the real inferential processes of induction and deduction are equally distinct, both at a psychological and at a neural level. In the face of the question: are there really factive differences between the psychological processes of deduction and induction?, the recent literature offers all logically possible answers. One line of work, the most extended and akin to the traditional comprehension of deduction, understands that there are in fact factive differences between the processes of deducing and inducing [3; 4; 10; 11; 15] as a consequence of an alleged a priori distinction between necessary and contingent consequence extraction. It is remarkable that this perspective is compatible with rival conceptualizations of deduction and of normativity in general. In particular, both the counter-example conception of deduction as also the calculative conception both in their truth functional and probabilistic versions assume that there are factive differences between deductive and non-deductive inferences. Another line of research records gradual factive differences between deducing and inducing either in a positive [7; 8] or a negative direction. Finally a third approach assumes that there are no factive differences between mental or cerebral inductive and deductive processes, as explicit in the words of Oaksford [9]: "...tasks are not deductive in and of themselves. What function a task engages is determined by the empirically most adequate computational level theory of that task".

This state of the art is extraordinary and shows that conceptual and experimental elucidation is needed on the eventual existence of deductive inferences, even if it is one of the oldest issues in science. From a psychometrical perspective, four basic measures of reasoning (operational, content, instantiation and strategies) confirmed [15] inductive and deductive procedures offered an equivalent contribution to measure reasoning. On the other part, pointing in an opposite direction, it is not evident that those factive processes in which inductions and deductions are realized are alien to the normative properties exemplified in them. For example, there are extended and repeated evidences systematically linking deductively canonical reasoning with cognitive capacities such as intellectual ability [2], intelligence indexes [14], psycotechnic competence [5], emotion handling [1], academic excellence and healthy cognitive ageing.

From the conceptual perspective, the frontiers between normative (logical or probabilistic) and factive (psychological or neural) inference have been historically blurred [16] and addi-

tionally there are not only rival conceptions of deduction as a psychological process, but also fundamental disagreements on the specificity of deductive inference at a neural level [6]. Even more importantly, there are rival conceptions of normativity and its import on factive processes [12; 13].

This paper introduces a number of measurable deductive variables and components: logical validity, probabilistic validity, computability, integration, logical vs relational complexity, modality, and reviews their presence in the most employed reasoning tests and subtests in conductual and neural research. For any given component, we determine if it is explicitly assessed and in that case if it is measured or quantified. We also consider non explicit deductive components which have influenced on reasoning tests, even if they are not quantified, assessed or even mentioned. The objective of the review is to gather the basic arguments, data and verify if one and the same deductive phenomenon is present in normative, psychological and neural levels. In the conceptual front, two constraints are proposed to give specific content to the hypothesis of factive deduction:

- factive deductive features should be qualifiedly invariant under distinct cognitive formats, in particular under linguistic/verbal and plastic/visual formats,

- a measurable construct of deductivity should include variables such as logical validity, computability, integration, logical vs relational complexity.

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