

Reasoning, Cognition and Life

A conference in honour of
Professor Ken Manktelow

Friday 16 May, 2014

For details, contact Dr Niall Galbraith
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A one day conference to coincide with Professor Ken Manktelow's retirement. The theme of the conference reflects Ken's research interests in the psychology of thinking, however there will also be innovative talks in other areas of psychology. We would like to welcome Ken's colleagues, friends and students to attend. The event should be an intimate and fun occasion. Many of Ken's collaborators, colleagues and friends from around the UK and from across the world are attending, meaning that there will be some truly excellent speakers on show.

Venue

MC Building
City Campus
University Of Wolverhampton

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Conference Programme			
Time	Venue: MC001	Time	Venue: MCb12
9:15-9:40	Refreshments in MC Building		
9:40-9:50	Opening remarks, Linda Lang & Richard Darby		
9:50-10:10	Tom Ormerod		
10:10-10:30	Fred Vallee-Tourangeau & Gaëlle Vallée-Tourangeau		
10:30-10:50	Iku Hattori		
10:50-11:10	Refreshments in MC123/124		
11:10-11:30	Andrew Colman		
11:30-12:15	Plenary: David Over & Jean Baratgin		
12:15-1:10	Lunch in MC123/124		
1:10-1:30	Valerie Thompson	1:10-1:30	Nilufa Ali, Chater & Oaksford
1:30-1:50	Max Roberts	1:30-1:50	Linden Ball
1:50-2:10	Nick Perham	1:50-2:10	Guillaume Gimenes
2:15-3:00	Plenary: Jonathan Evans		
3:00-3:20	Refreshments in MC123/124		
3:20-3:40	Masaki Hattori	3:20-3:40	Bo Zhang, Galbraith, Yama, LWang, Manktelow
3:40-4:00	Harriet Over	3:40-4:00	Briony Pulford, Colman & Gold
4:00-4:20	Veronique Pardieu	4:00-4:20	Simon Handley
4:20-4:40	Sandra Lepeltier, Salvano-Pardieu, Combalbert & Fontaine	4:20-4:40	Shira Elqayam
4:45-5:30	Plenary: Ken Manktelow		

Titles and Abstracts

Nilufa Ali

(Queen Mary, University of London),

Nick Chater (University of Warwick)

&

Mike Oaksford

(Birkbeck)

Interpretation and Discounting in Causal Conditional Inference: Towards an Integrative Model

To adequately compare psychological theories of reasoning requires that the materials are equally interpretable in terms of each theory. In this paper, experiments are reported which provided independent evidence for the interpretations of pairs of conditionals—sentences rendered in English as “if...then”—used in discounting inferences to test the mental models and causal models theories. In Experiment 1, using appropriate statistical tests in which the null can be supported, there was decisive evidence in favour of causal model theory, replicating previous research (Ali, Chater, & Oaksford, 2011). Experiment 2 addressed a potential confound and allowed a test of more varied interpretations of the conditional. This experiment provided strong evidence against this confound and for the causal model theory. Explaining the evidence for this confound in Experiment 1 suggested an integrative model in which mental models type representations are used to construct a cumulative record in working memory of the results of interrogating a dynamic causal model.

Linden Ball (University of Central Lancaster) & **Caroline N. Wade** (Lancaster University)

Pragmatic Factors in Hypothesis Testing: The Case of Wason’s 2-4-6 Task

The 2-4-6 task was devised by Wason (1960) to investigate people’s hypothesis testing behaviour. Despite the task’s apparent simplicity only about 20% of reasoners successfully announce the to-be-discovered rule. Various cognitive factors have been implicated in failed task performance, such as a bias toward using a “positive test strategy”, whereby new triples are generated that match the reasoner’s current hypothesis (Klayman & Ha, 1987, 1989). More recent research has suggested that pragmatic factors are also involved in task failure. For example, Van der Henst et al. (2002) showed that the experimenter’s presentation of the 2-4-6 exemplar contains a strong presumption of “relevance”, which promotes fixation upon the unique properties of this seed triple. We report a series of 2-4-6 experiments that support the role of pragmatic factors in unsuccessful performance, with the evidence suggesting that people often fail from the outset to approach the task as one that requires hypothesis testing. We present a further experiment involving an instructional manipulation that clarifies to participants that the task’s objective necessitates hypothesis testing. As predicted, this manipulation produced high levels of facilitated rule discovery. In sum, it appears that fine-tuning various pragmatic aspects of the 2-4-6 paradigm can reveal that people are, after all, effective hypothesis testers, thereby providing a more positive account of their inductive reasoning skills.

Andrew Colman
(University of Leicester)

Rationality in Centipede Games

Backward induction is a reasoning process that underlies the first theorem ever proved in game theory. When applied to the Centipede game, it leads to a conclusion that is not merely paradoxical but incredible, and experimental evidence shows little evidence that it influences experimental subjects. I shall argue that its widely accepted application to the Centipede game is fallacious and that a different form of reasoning is required.

Shira Elqayam
(De Montfort University)

Dutch book arguments are not all they're cracked out to be

Dutch books are wagers that always lead to loss; Dutch book arguments are the thesis that conforming to the norms of the probability calculus confers immunity to Dutch books, whereas violating these norms exposes the violator to a Dutch book being made against them. Probability theorists use Dutch book arguments to create a link between normative and instrumental rationality. However, the link is less psychologically plausible than has been claimed. I will explore Dutch book arguments in view of the psychological literature on risk perception and judgements of probability, as well as some of the relevant philosophical critiques. Hájek's (e.g., 2008) famously showed that each Dutch book has a mirror-image 'Czech' book, which guarantees sure win. If two agents share a non-coherent set of probability estimates, both are equally non-normative, but the outcome for the Dutch book agent is far less favourable than the outcome for the Czech book agent. I will argue that the distinction between normative and instrumental rationality remains robust.

Jonathan Evans
(Plymouth University)

Whatever happened to the selection task?

Wason's selection task, first published in 1966, became a major paradigm for the study of human reasoning in the 1980's and 90's. However, papers studying the task have declined sharply post-2000. In this talk, I give a brief history of the problem tracing its rise to form the centre-piece of debates about dual processes, content-based reasoning, evolutionary theory and decision theoretic treatments of reasoning. I also speculate about the reasons for the fall of interest in the task in recent years and ask whether it was ever a task that elicited much in the way of reasoning from the participants to whom it was given.

**Guillaume Gimenes &
Valérie Pennequin**
(Université de Tours, France)

What is the best strategy to retain gestures in working memory?

Background: According to Baddeley's model (Baddeley, 2011), gestures might as well be treated by the visuo-spatial sketchpad or the phonological loop in working memory. However, studies by Smyth, Pearson and Pendleton (1988) and Gimenes, Pennequin and Sorel (2013) suggest that none of these components are in charge of gestures, although it has the same characteristics as the phonological loop (Wilson & Fox, 2007). Even though verbalization seems to be a spontaneous strategy to recall encoded gestures (Frencham, Fox & Maybery, 2003, 2004; Miyahara et al., 2013), literature indicates that it only benefits performances when the strategy is controlled (Frencham et al., 2004). Another way to improve performances could be the use of a gestural strategy. In one of Smyth et al.'s experiment (1988) participants had to repeat gestures in a training session just before the experimental session. This strategy countered the deleterious effect of articulatory suppression on the recall of gestures, observed in another of their experiments.

Objectives: The aim of our research was double, first to determine if the recall of gestures in working memory could be enhanced either by a verbal strategy or a gestural strategy; second to determine if these strategies could help to resist verbal or gestural interferences.

Participants: 54 volunteers (27 male, 27 female) aged from 18 to 26 ($M = 21.4$, $SD = 2.34$) were recruited in Tours, France.

Methods: Participants were divided into three groups according to the content of the training session: a control group; a verbal strategy group (each gesture was associated to a label); a gestural strategy group (participants repeated gestures and they were told to imagine themselves reproducing the movements). During the experiment, the participants had to reproduce series of gestures under three conditions: control; gestural interferences (gestural suppression) and verbal interference (articulatory suppression).

Results: The results indicated an enhancement of performances of the verbal strategy group whereas the performances of the gestural strategy group were not significantly different from the control group. Moreover, compared to the control condition, performances were decreased during the condition of gestural interferences except for the verbal strategy group. Finally verbal interferences decreased performances whatever the group.

Discussion: The discussion focuses on the use of the phonological loop instead of a "gestural loop" for the verbal strategy group. The recruitment of the phonological loop to retain gestures significantly increased performances and reduced the detrimental effect of gestural interferences. We also differentiate the impact of induced strategy from self-initiated strategies, which seems to be detrimental for performances.

Conclusion: Practically, it seems more efficient to initiate the learning of a word corresponding to a gesture, rather than repeating these gestures without naming them.

**Simon J. Handley &
Dries Trippas**
(Plymouth University)

The case for an intuitive logic.

Dual process accounts of reasoning make a distinction between Type 1 processes that are thought to be automatic and intuitive in nature and Type 2 processes that are conscious and effortful to apply. A number of authors have claimed that beliefs influence logical reasoning because reasoners are unable to inhibit intuitive belief-based responses in favour of resource intensive, logical analysis. In this paper I will present the results of a series of studies which show: 1) Evaluating the logical validity of a conclusion to a simple reasoning task is often accomplished more quickly than evaluating its believability; 2) The logical validity of a conclusion interferes with judgments of its believability more than vice versa and 3) Participants provide higher ratings for logically valid conclusions than logically invalid ones. These effects apply to rating scales unrelated to the validity dimension (brightness, liking). Taken together these findings suggest that logical reasoning is often accomplished rapidly and 'by default'. We discuss these findings in the context of recent claims of an intuitive basis for logical processing.

**Ikuko Hattori (Ritsumeikan
University, Japan)**

The impact of non-occurrent events in causal induction: AB frames.

Accurate Causal judgments demands correct causal models and exact covariation information about the co-occurrences of the events. However, it is well-known that non-occurrence of the events is difficult for humans and other animals to be recognized and that participants usually take account of the occurrence of the target events more than the non-occurrence (e.g., Kao-Wasserman, 1993).

In this study, two experiments demonstrated the cases that participants take account of the non-occurrence of the events voluntarily and the cases that they ignore the information about the non-occurrence. These results support that the new frames of thinking, that is to say, A-frame and B-frame ("A" stands for attentional and "B" stands for balanced) proposed by Hattori (2014) can be applied to the explanation for causal induction. In A-frame, people tend to focus on the distinctive feature of events and the non-occurrence is likely to be ignored. In B-frame, people tend to compare the occurrence and the non-occurrence analytically. The results suggest that the psychological asymmetry of the occurrence and the non-occurrence of the events should be an important key to understand human causal reasoning.

Masaki Hattori
(Ritsumeikan University, Japan)

Probabilistic representation in syllogistic reasoning.

**Sandra Lepeltier, Véronique
Salvano-Pardieu, Nicolas
Combalbert & Roger
Fontaine.**
(Université de Tours, France)

Development of the extenuating circumstances in judgment of blame in typical children, adolescents and young adults.

Anderson's method and integration information theory are used to understand the evolution of taking extenuating circumstances into account in moral judgment according to the aging process. These theories are also used to figure out whether extenuating circumstances are linked to ability to judge an action according to the intent of actor or they correspond to a third factor. Three groups have been tested: children ($n = 60$, $M = 11.4$ y/o, $SD = 1$), adolescents ($n = 60$, $M = 15.1$ y/o, $SD = 1.3$) and 60 young adults ($n = 60$, $M = 19.6$ y/o, $SD = 1.3$). Results show significant differences between the three groups. Indeed, children take extenuating circumstances into account only when there is no consequence and they present a "justice orientation". Adolescents are able to distinguish verbal and physical extenuating circumstances whatever the level of consequences. "Care orientation" reflects more adolescents' state of mind. Finally, young adults do not make distinction between verbal and physical extenuating circumstances anymore. Contrary to children, they take extenuating circumstances into account only when there are consequences even if, like children, they present a "justice orientation". Taking extenuating circumstances into account seems to be a progressive process which does not follow the development of intentions.

Tom Ormerod (University of
Surrey)

"If you must eat haddock, then you'll need a lot more gin": Exploring the legacy of adding meaning and purpose to studies of deductive reasoning."

This talk explores some of the key contributions made by Ken Manktelow to enhancing our understanding of human deductive reasoning. Critical ideas, such as what makes thematic content genuinely meaningful and how perspective can radically alter the decisions we make, have had a strong influence on reasoning research. The influence of purpose (i.e., what individuals are trying to achieve when they draw or endorse inferences) was central to the presenter's PhD research on reasoning and computer programming, which was supervised by Ken. Ways in which meaning and purpose continue to influence practical reasoning applications and theories of deduction will be discussed.

David Over (Durham University)
& **Jean Baratgin** (Paris 8 University, France)

The “defective” truth table: Its past, present, and future.

In the so-called “defective” truth table, a conditional, *if p then q*, is held to be true in the *p & q* cell, false in the *p & not-q* cell, and to have some other, third value in the *not-p* cells. Many of us here first heard of the “defective” truth table from Ken. He introduced us to it in his lectures or his beautifully written book, *Thinking and Reasoning*. If we were really lucky, he explained it to us in an illuminating research discussion, which so easy to have with Ken. Wason (1966) was the first psychologist to refer to what came to be known as the “defective” truth table, although he did not use the term “defective” for it. Johnson-Laird & Tagard (1969) said more about it, and noted that it had been proposed earlier by the philosophers Quine (1959) and Kneale & Kneale (1969). Johnson-Laird & Wason (1970) appear to have been the first psychologists to use the term “defective” for the table. We will point out that this table was proposed much earlier by de Finetti (1936) and discuss why it should be called the “de Finetti” table. We will also address a surprisingly neglected question in the psychology of reasoning, “What exactly is the third value?” We will quickly summarize our recent research which interprets the third value as uncertainty. We will argue that future research should refine this notion of uncertainty into degrees of probability. The new focus should be on the “Jeffrey” table, in which the uncertainty value in the *not-p* cells becomes the conditional probability of *q* given *p*, $P(q|p)$.

Harriet Over
(University of York)

The origins of loyalty: Young children’s commitments to their social groups.

As adults, loyalty to the group is very important to us. We stick with our group even when it costs us to do so and, at times, we punish individuals who leave the group very harshly. However, little is known about the origins of loyalty in young children. I will report data from two experiments investigating when children first demonstrate loyalty to the group and when they first value loyalty in others’ behaviour. I will discuss how this emerging commitment to the group enables children to become reliable collaborators and how, in doing so, it facilitates successful group cooperation.

Nick Perham (Cardiff Metropolitan University)

‘Not thinking’ helps reasoning.

Despite previous research suggesting that participants’ negative and positive emotions can impair and facilitate reasoning performance, a recent study proposes that the emotional content of the mood induction materials may not be crucial in eliciting these phenomena—deontic selection task performance is as poor when these materials are neutral as when they are negative (Perham and Oaksford, 2006). We extend this finding to syllogistic reasoning performance. Participants in the mood induction conditions (negative and neutral) verbally described their experiences in relation to twenty negative or neutral words whereas participants in the control condition received no such mood induction. Subsequent syllogistic reasoning performance was significantly poorer for both mood induction conditions yet only those in the negative mood induction condition showed a significant increase in anxiety. Results imply that the key mechanism involved in the impairment derives from the production of irrelevant thoughts and that these need not be linked to a positive or negative mood, thus “not thinking” may actually help the reasoning process.

Briony Pulford, Andrew Colman,
(University of Leicester)
& **Natalie Gold**
(Kings College London)

Cultural differences in life and death decision making.

Trolley problems have been used in the development of moral theory and the psychological study of moral judgments and behaviour. Most of this research has focused on people from the West, with implicit assumptions that moral intuitions should generalize and that moral psychology is universal, but there may be cultural differences in moral judgments and behaviour. We operationalized a trolley problem in the laboratory, with economic incentives and real-life consequences, and compared British and Chinese samples on moral behaviour and judgment. We found that Chinese participants were less willing to sacrifice one person to save five others, and less likely to consider such an action to be right. In a second study using three scenarios, including the standard scenario where lives are threatened by an on-coming train, fewer Chinese than British participants were willing to take action and sacrifice one to save five, and this cultural difference was more pronounced when the consequences were less severe than death.

Maxwell Roberts
(University of Essex)

Selection Tasks, Syllogisms, and Schematic Maps: Understanding Human Cognition (more) by expanding traditional paradigms.

Véronique Salvano-Pardieu (Université de Tours), **Romuald Blanc** (Université R. Descartes), **Nicolas Combalbert** (Université de Tours), **Aurélia Pierratte** (Université de Tours), **Sandra Lepeltier** (Université de Tours), **Ken Manktelow** (University of Wolverhampton), **Guillaume Gimenes** (Université de Tours), **Catherine Barthelemy** (Inserm 930 CHU Bretonneau) & **Roger Fontaine** (Université de Tours)

Judgment of blame in teenagers with asperger's syndrome .

The judgment of blame was studied in a group of twenty six teenagers, thirteen with Asperger syndrome and thirteen typically developed. Teenagers in each group were matched by age, cognitive development and academic level. In twelve short vignettes teenagers had to judge an action according to the intent (with, without) of the actor, the consequences (with, without) of the action, and the seriousness of the consequence (low, medium, high). Results showed a significant difference in the patterns of judgment of both groups. The AS group judged the action according to the consequence more than the intent, the opposite was observed with the control group. In addition, Asperger syndrome teenagers were less capable of taking seriousness into account when apportioning blame. A model of two different cognitive structures involved in moral judgment, one based on Theory of Mind and perspective taking and the other on deontic reasoning, is discussed.

**Frédéric Vallée-
Tourangeau & Gaëlle
Vallée-Tourangeau**
(Kingston University)

Practical vs. Theoretical Hypothesis-testing and Information Search: Utilities Shape Human Reasoning.

The distinction between deontic and indicative reasoning, practical and theoretical reasoning, and ultimately the contrast between two forms of rationality, was a watershed moment in the psychology of reasoning. Manktelow and Over (1991), and Evans, Over, and Manktelow (1993) clearly and forcefully distinguished between practical and theoretical reasoning and offered a productive perspective from which to explore traditional reasoning tasks qua decision making contexts where outcomes have utilities. We have drawn much inspiration from this perspective and took the challenge of designing contexts of reasoning where decision utilities shape reasoners' intuitions. For example, we demonstrated that hypothesis testing behaviour in the Wason 2-4-6 task is transformed when the task is embedded in a practical reasoning problem where number sequences have well-defined utilities in the process of achieving a goal. We also examined the so-called pseudodiagnostic reasoning phenomenon in information search tasks and demonstrated that manipulating the utility of the information presented determined whether people make diagnostic or pseudodiagnostic selections for additional information. More generally, the distinction between practical and theoretical reasoning has encouraged us to explore the context of reasoning, rather than focus on individual differences, as a research strategy to shed light on thinking.

Bo Zhang(Osaka City
University, Japan)
Niall Galbraith
(University of
Wolverhampton)
Hiroshi Yama
(Osaka City University, Japan)
Lei Wang
(Anhui Agricultural University,
China) &
Ken I. Manktelow
(University of
Wolverhampton)

Dialectical thinking: A cross-cultural study of Japanese, Chinese, and British.

Since Peng and Nsibett (1999) found that Chinese are more apt to do dialectical thinking than Americans are, it is proposed that Westerners' thinking style is rule-based whereas Easterners' thinking style is dialectical. We gave the dialectical self-scale questionnaire and ten pairs of opposing opinions to high school and university students of Japanese, Chinese, and British. We asked them to fill in the questionnaire, to rate how strongly agree with each opinion, and to rate how wise it is to think dialectically. The score of the questionnaire was higher among Easterners than among Westerners, and higher among university students than among high school students. But, the results of opinion agreement indicated that the dialectical tendency was stronger among Chinese and British than among Japanese and that it was weaker among university students than among high school students. Furthermore, however, Japanese judged dialectical thinking as wiser than Chinese and British did, and Chinese university students believed it as wiser than Chinese high school students did. We propose that this effect is attributed to Marxism education in China. In short, these three aspects of dialectical thinking, dialectical self and wisdom judgment of dialecticism, showed different patterns of cultural differences.

