Centre for Cognition, Computation and Modelling, Birkbeck one-day Workshop:

Randomness & Structure

Friday February 20th, Birkbeck, University of London

Speakers:

Nick Chater, Warwick Business School

Peter Ayton, Dept. of Psychology., City University, London

Michael Aitken Deakin, IOPPN, King's College London

Paul Warren, Psychol. Science, University of Manchester

Rick Cooper, Psychological Sciences, Birkbeck

Time: 10:30 -16:30, coffee from 10:00
Place: room B34 Malet Street, Birkbeck Main Building, Torrington Square

Attendance free, though we would appreciate indication of intent to attend to: u.hahn@bbk.ac.uk

Titles & Abstracts

Nick Chater: Simplicty, simplification and attention

Suppose the brain seeks to simplify its input. But attention is limited: we can only attempt to simplify limited aspects of the input at any time. Limited attention may partly explain why we fail to see patterns when they are present; but also when we imagine patterns when they are not present. This is because we can actively select which data to focus on, neglecting all the other data than we might have focussed on. From this point of view, we perceive a pattern as random if we can't simplify it---but the local nature of attention (and other processing limitations) implies some of the observed anomalies in randomness judgements.

Peter Ayton: From unbounded irrationality to bounded rationality: a look back at randomness research.

I will take a brief look back at how the theoretical assumptions and experimental methods of researchers into human Definitions of randomness, experimental procedures and methods of analysis vary as researchers have tried to discover

and explain how people conceive of and use randomness and whether they do so appropriately. The history of research on randomness provides a case study of the reasoning processes of psychological researchers.

Mike Aitken, Luke Clark & Eve Oldfield: Cognitive distortions in sequential betting tasks

Many gambling games (slot machines, wheel of fortune, roulette, lottery) involve a randomizer which generates a series of independent outcomes. When making bets or predictions, individuals are known to be influenced by the nature of recent outcomes, both in terms of their perceived subjective efficacy (believing that a streak of wins will continue), and in terms of the perceived properties of the sequence (believing that a run of similar outcomes from a roulette will end, or that a win is more likely if outcome seemingly 'close' to a win occur). The role of these two types of distorted perception are difficult to separate in real gambling games, as feedback from individual outcomes may influence both forms of perception. We present analyses of simplified gaming tasks which attempt to separate these two forms of influence.

Paul Warren: Assessing the 'bias' in human randomness perception

We assess human randomness perception using both generation and judgement tasks. Crucially we consider a range of metrics and suggest that they are not all equally suited to characterising randomness perception. In particular, using a metric which takes account of limitations in cognitive processing (similar to the sliding window analysis of Hahn & Warren, 2009), group level human performance looks rather well matched to that of an unbiased source. However, we also note marked individual differences and discuss these in terms of commonly reported randomness bias phenomena.

Richard P. Cooper & Nicholas J. Sexton: A Process Model of Random Generation

We present simulation results from a computational model of random sequence generation formulated within a novel, neuropsychologically-inspired, cognitive architecture, the Executive Subprocesses Architecture (ESPro, Sexton & Cooper, 2014). This model allows investigation of the interaction between executive control processes (such as task setting, response proposal response monitoring, and response inhibition) as well as beliefs about the characteristics of random processes. It is shown how the model captures key empirical phenomena within the literature on random sequence generation.