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Rational revision? Bridging computational, empirical, and theoretical perspectives on belief updating and polarisation

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Introduction

The phenomenon of belief polarisation—in which people update their beliefs in opposing directions, particularly after observing the same evidence—has garnered growing attention and concern in recent years from across the fields of philosophy, political science, psychology, and sociology, particularly as misinformation and ideological polarisation have threatened the fabric of political and social consensus (Allcott et al., 2019; Haghtalab et al., 2021; Lelkes, 2016; Wilson et al., 2020). Despite the recognition of belief polarisation as an emerging social phenomenon (or perhaps thanks to its very existence) both by scientific researchers and major social institutions such as governments and business, there has been relatively little work aiming to explicitly unify various strands of theorising regarding the causes of belief polarisation and strategies for addressing its consequences.

From a psychological perspective, some research has characterised belief polarisation as the product of motivated cognition, drawing people away from “rational” inferences and towards beliefs that align with their personal and political preferences (Jost et al., 2022; Kahan, 2017; Mobius et al., 2011). Others have suggested that cognitive constraints on human cognition such as attention or sampling cost could lead people’s beliefs to diverge (Nimark & Sundaresan, 2019; Novák et al., 2024; Pennycook & Rand, 2019), and that in some cases belief polarisation might even be rational given that people hold differing beliefs about causal structure (Jern et al., 2014; Singer et al., 2019; Young et al., 2025). Political and social scientists have variously proposed that social media has amplified polarisation by producing “echo chambers” in which opposing perspectives are drowned out (Sunstein & Sunstein, 2018; Törnberg et al., 2021), or alternately that the prevalence of such echo chambers is overstated (Dubois & Blank, 2018; Ross Arguedas et al., 2022) or that their content is significantly more varied than assumed (Bright et al., 2020). Simulations have also examined the situations under which stable polarisation occurs, sometimes finding that it is brittle and can be disrupted by even a small amount of shared ground truth (Gelpí et al., 2025; Perfors & Navarro, 2019),

and other times that it is inevitable, given certain relatively broad social conditions are met (Fränken & Pilditch, 2021).

Goals and Target Audience

Faced with the diversity of theorising about the sources, prevalence, and consequences of belief polarisation, this workshop aims to bring together researchers from different disciplines to tackle the questions of how to best characterise how, when, and why people update their beliefs, and the implications of polarisation on our theories of learning, belief revision, political cognition, and epistemic trust. Drawing inspiration from the *Listening and Learning in a Polarized World* (LLPW) initiative funded by the Templeton World Charity Foundation, we have collected speakers who will provide novel theoretical, computational, and empirical contributions to understanding the processes of belief change, particularly as it relates to the phenomenon of belief polarisation.

We anticipate broad interest to the researchers in the cognitive science community interested in belief change and perseverance, including but not limited to computational cognitive scientists, cognitive neuroscientists, social psychologists, political psychologists, behavioural economists, and philosophers. The topic would also speak to people who are concerned with interventions and application, as research in polarisation directly points to current societal issues. Our speakers and topics draw from this same broad range of relevant disciplines, and feature substantial geographic diversity, so our aim is to make these topics accessible to anyone with an interest in belief change and polarisation.

Organisers and Presenters

Rebekah Gelpí (*organiser*) is a postdoctoral researcher in the Department of Computer Science at Johns Hopkins University. She is interested in using computational models to understand the processes of social learning and the development of social norms.

Daphna Buchsbaum (*organiser*) is an Associate Professor in the Department of Cognitive and Psychological Sciences at Brown University. Her work aims to understand belief updating and revision in humans and nonhuman animals, using computational models of belief revision.

Jens Koed Madsen (*organiser*) is an Assistant Professor in the Department of Psychology and Behavioural Science at the

London School of Economics and Political Science. He interested in how belief and behaviour impact democratic stability, information fragility, discrimination, and environmental sustainability.

David Young (*organiser*) is a postdoctoral researcher in the School of Psychological Sciences at Birkbeck, University of London and an incoming Lecturer at University of Cambridge. He is interested in applying theories and methods from cognitive science to political psychology.

Manikya Alister (*presenter*) is a postdoctoral scholar at UC Berkeley broadly interested in how and why people learn from other people.

Gordon Brown (*presenter*) is a Professor of Psychology at the University of Warwick. He has interests in behavioral science, agent-based modelling of social influence, and political polarisation.

Saoirse Connor Desai (*presenter*) is a cognitive psychologist who investigates how people think and form beliefs, especially in determining which information to trust. Her findings focus on understanding misinformation, especially in legal, health, and political contexts.

Laura K. Globig (*presenter*) is a cognitive neuroscientist and postdoctoral fellow at New York University studying how reward motivations shape decision-making in technology-mediated environments.

Ulrike Hahn (*presenter*) is a cognitive scientist at Birkbeck College, University of London who works primarily on human rationality with a focus on argumentation as well as argument exchange across social networks.

David Lagnado (*presenter*) is a Professor of Cognitive and Decision Science at UCL working on causal reasoning, belief updating and decision making.

Antoine Victor Marie (*presenter*) is a postdoctoral researcher at the Center for Political Research (CEVIPOF), Sciences Po Paris. His work explores how people reason and communicate about divisive political topics.

Almos Molnar (*presenter*) is a doctoral candidate of Cognitive Science at Brown University, specializing in collective reasoning and political psychology.

Arthur Prat-Carrabin (*presenter*) is a postdoc in the Psychology Department at Harvard University, and he is interested in the cognitive and neural mechanisms underlying perception, representation, inference and decision-making.

Cailin O'Connor (*presenter*) is a Chancellor's Professor of Philosophy at the University of California, Irvine specializing in social epistemology, the philosophy of science, and collective belief formation.

Joaquin Navajas (*moderator*) is an Associate Professor at the Business School at Universidad Torcuato Di Tella. His research seeks to understand social influence on people's judgments and beliefs and its relationship to political polarisation.

Workshop Structure

This full-day workshop will feature ten talks of roughly 20 minutes of speaking and 5-10 minutes of questions. After a

block of three or four talks, there will be a panel discussion of speakers for an additional 30 minutes. The first 15 minutes of each panel discussion will be guided by a panel moderator, who will pose prepared questions to each of the speakers on common workshop themes, with the remaining time dedicated to answering audience questions. Between the first and second blocks, we will have a short lunch break. Between the second and third blocks, there will be a second break for a poster session dedicated to highlighting new research touching on the topics of polarisation and belief change. We provide a proposed schedule for the workshop in Table 1.

Table 1: Proposed schedule for workshop.

Presenter	Topics Covered
Laura Globig	How AI can circumvent bias in information-seeking
Manikya Alister	Understanding online polarisation using a custom social media platform
Almos Molnar	Intervening on polarisation through consequentialist framing of issues
Cailin O'Connor	Many paths to polarisation
All presenters	Panel discussion
Lunch break	
Gordon Brown	The importance of out-group differentiation in issue alignment and polarisation
Arthur Prat-Carrabin	Computational models of belief imprecision
David Lagnado	The causal dynamics of belief change
All presenters	Panel discussion
Coffee break and poster session	
Antoine Victor Marie	The press secretary hypothesis of political cognition
Saoirse Connor Desai	Repetition as a credibility cue in belief updating
Ulrike Hahn	Misinformation & polarisation as system-level issues
All presenters	Panel discussion

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