Aberrant Beliefs and Reasoning

Edited by
NIALL GALBRAITH
An aberrant belief is extreme or unusual in nature. In the most serious cases these beliefs cause emotional distress in those who hold them, and typify the core symptoms of psychological disorders. Each of the chapters in this volume seeks to examine the role that biases in reasoning can play in the formation of aberrant beliefs.

The chapters consider several conjectures about the role of reasoning in aberrant belief, including the role of the jumping to conclusion bias in delusional beliefs, the probabilistic bias in paranormal beliefs, the role of danger-confirming reasoning in phobias, and the controversial notion that people with schizophrenia do not succumb to specific forms of reasoning bias. There are also chapters evaluating different theoretical perspectives, and suggestions for future research.

*Aberrant Beliefs and Reasoning* is the first volume presenting an overview of contemporary research in this growing subject area. It will be essential reading for academics and students in the fields of human reasoning, cognitive psychology and philosophy, and will also be of great interest to clinicians and psychiatrists.

*Niall Galbraith* is Senior Lecturer in Psychology at the University of Wolverhampton, UK. His research interests encompass delusional thinking, schizotypy, attitudes toward psychological disorders and help-seeking.
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Edited by Niall Galbraith
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Lisa Bortolotti, University of Birmingham, UK
Matthew R. Broome, University of Oxford, UK
Valentina Cardella, University of Messina, Italy
Kate Cavanagh, University of Sussex, UK
Kate Daley, Newcastle University, UK
Peter J. de Jong, University of Groningen, Netherlands
Robert Dudley, Newcastle University, UK
Niall Galbraith, University of Wolverhampton, UK
Amelia Gangemi, University of Messina, Italy
Claire Jones, University of Wolverhampton, UK
Ken Manktelow, University of Wolverhampton, UK
Mahesh Menon, University of British Columbia, Canada
Kengo Miyazono, University of Birmingham, UK
Contributors

Steffen Moritz, Universitätsklinikum Hamburg-Eppendorf, Germany

Stephanie Rhodes, University of Wolverhampton, UK

Paul Rogers, University of Central Lancashire, UK

Stephen Smith, Newcastle University, UK

Todd S. Woodward, University of British Columbia, Canada; and British Columbia Mental Health and Addictions Research Institute, Canada
Something interesting happened in the psychology of reasoning in the late 1990s and, looking around, we can see it happening in other areas too. For a long time, possibly since the dawn of the cognitive era in psychology 40 years before, researchers had been largely content with the classic hypothesis-testing experimental setup, whereby you give some materials to a group of ‘subjects’, as we used to say, in a factorial design, and compute the significance of any observed differences between the groups. These computations preferably, if you wanted to publish in the best journals, involved parametric statistics, those that take account of averages and variances.

But an average can conceal as much as it reveals, because in any distribution of scores, the people scoring high or low, or in the middle, might be doing so for a reason that the experiment is not addressing: they might be different sorts of people. Somehow, then, the individual person had got lost along the way. Consider the lodestar of reasoning research: the Wason selection task. It has been known since its earliest times that around 90% of participants, as we now say, fail to select the solution sanctioned by standard logic, a figure that has stayed stable ever since (Manktelow, 2012). The interesting thing that happened in the psychology of reasoning was that Stanovich and West (1998, 2000; Stanovich, 1999) asked: what is it about the logical 10%? What have they got that the rest of us lack?

High intelligence turned out to be the answer, depressingly for someone who was completely baffled by another of Wason’s problems, the THOG problem (Wason & Brooks, 1979), on first encountering it. But not the whole answer. Stanovich has gone on to show that other dimensions of individual difference also predict reasoning performance: dimensions of personality. To think your way through reasoning problems, you need not only the appropriate skills, or mindware as Stanovich calls them, but the propensity to use them appropriately. People differ in this, and so they differ in their ability to think rationally; some people cannot see
below the problem’s surface, and so give the immediate, intuitive response, the System 1 response in the terms of dual system theory (Evans, 2010; Kahneman, 2011; Stanovich, 2011). But some find it easier to park these initial heuristic impressions and work through the problem’s implications, using System 2, and some are much better than others at seeing the need to do this in the first place.

Thus there are documented individual differences in the ability to think rationally, just as there are in intelligence, but intelligence and rationality are readily separable – we all know people who are clever but not in the least bit streetwise. Which brings us to the concerns of this book, which are with the kinds of reasoning associated with one form of extreme irrationality, the one associated with aberrant beliefs. Aberrant beliefs take various forms, as you will see from the chapters presented here: phobic beliefs, belief in the paranormal and, most studied of all, delusional beliefs.

Research into aberrant beliefs and reasoning ran parallel to the research on individual differences outlined above, but it is a property of parallel lines not to touch. Except that now they do, and one of the goals of the present volume is to describe aspects of this convergence. One vehicle for it has been the acceptance of the continuity model of mentality (Claridge, 1988), the notion that there are measurable degrees of thinking tendencies which in their extreme forms would be classed as clinical disorders: paranoia, for instance. We are all sensitive to being watched, talked about or conspired against, to some degree, at some times, but only when your normal functioning is interfered with do you have a clinical condition.

Fortunately, there is now a battery of measures of subclinical delusional ideation, paranormal beliefs and so on, which have opened up numerous routes into the kinds of research areas that are portrayed here. The sense is of a field that is already substantial and gathering pace, which has produced important outcomes of both scientific and human significance, and can only produce more in the future. This is a good time to take stock of what has been done so far, and where the signposts are pointing.

Ken Manktelow
University of Wolverhampton

References


The title of this text contains the term ‘aberrant beliefs’, which we define as beliefs which are extreme or unusual in nature, or which (in the most serious cases) may cause emotional distress or social turmoil to the individuals who hold them. Thus the types of belief which are explored in this book are mostly those which typify core symptoms of psychological disorders: in particular, delusions and phobia. In addition to delusional and phobic beliefs, this book also explores paranormal belief and there is some controversy in claiming that paranormal ideas are aberrant. Paranormal beliefs are common, do not necessarily reflect psychological disorder and are not necessarily associated with extreme distress or with social turmoil. Despite this, there is some evidence that paranormal beliefs may predict psychotic disorder (Cella, Vellante & Preti, 2012; Thalbourne, 1994), even though such beliefs often manifest in a non-clinical form (Genovese, 2005; Schofield & Claridge, 2007). Furthermore, paranormal beliefs can overlap with delusional themes and may occupy a place on the psychosis continuum (Goulding, 2005). One must be careful not to pathologise paranormal belief per se, but the theoretical overlap between common paranormal belief and delusions suggests that the study of the former may provide valuable insights into the latter and perhaps into psychological disorder.

The question of whether reasoning plays a role in aberrant beliefs has become increasingly important for psychology, psychiatry and philosophy. The popularity of this idea is usually credited to Beck (e.g. Beck, 1976; Beck & Clark, 1997), who championed the role of thought processes in the development and maintenance of depression and anxiety. Specifically, Beck argued that psychological disorders could be understood and treated once the therapist identified the faulty inferences and beliefs which were contributing to the cause and maintenance of the disorder. Since the emergence of Beck’s cognitive theory of anxiety and depression, research into reasoning and psychopathology has intensified considerably. A large volume
of research literature has been generated on reasoning in relation to delusional and paranormal beliefs as well as anxiety and phobia.

The bulk of the chapters in this volume focus on reasoning in delusional beliefs. The study of reasoning biases in people with delusions began with the proposal by von Domarus (1944) that schizophrenic thinking was underpinned by reasoning which was illogical. Subsequently, however, due to repeated failures to uphold this hypothesis (e.g. Williams, 1964) and the growing realisation that human reasoning itself was often at odds with formal logic (Manktelow & Over, 1987; Wason, 1968; Wason & Evans, 1975), the study of delusional reasoning biases fell out of favour. However, in the late 1980s, researchers began again to examine the area, perhaps with the implicit understanding that, although normative systems such as logic may serve as a benchmark for describing what the deluded do and do not do when they reason (e.g. Bayes’ Theorem, see Garety & Hemsley, 1994), mere deviation from a normative system should not be taken as a starting point for pathological thinking. Instead studies began to report on the differences between patient and control groups on a range of reasoning tasks: Brennan and Hemsley (1984) demonstrated that paranoid patients were prone to illusory correlations, and Huq, Garety & Hemsley (1988) found evidence for a jump-to-conclusions (JTC) reasoning bias in patients with delusions. The implication of these findings was that delusional patients may display biases in reasoning which could contribute to the formation and/or maintenance of delusional beliefs.

Over the next two and a half decades, the study of delusional reasoning grew. The field has been advanced by research groups all over the world. In the UK, Rob Dudley has produced a number of definitive papers on the jump-to-conclusions bias. The group led by Philippa Garety and Daniel Freeman has published prolifically on the JTC bias as well as on a range of other psychological factors in delusions, culminating in the threat anticipation model of paranoia (Freeman, 2007; Freeman, Garety, Kuipers, Fowler & Bebbington, 2002).

From outside the UK, the partnership between Steffen Moritz (from Germany) and Todd Woodward (from Canada) has led to new perspectives on the JTC bias. One of their important contributions is the notion that people with delusions have a liberal acceptance threshold for implausible ideas or for weak evidence (e.g. Moritz, Woodward & Lambert, 2007). They have also produced a number of influential papers outlining findings of a bias against disconfirmatory evidence (BADE; Woodward, Buchy, Moritz & Liotti, 2007). More recently, they have used their empirical work to develop a promising method for training people with psychological disorders to modify unhealthy reasoning (Moritz, Veckenstedt, Randjbar, Vitzthum & Woodward, 2011).

Another influential research team, based mainly in Australia and led by Max Coltheart, Robyn Langdon, Ryan McKay and colleagues, has developed the two-factor theory (Coltheart, Menzies & Sutton, 2010; Davies & Coltheart, 2000) of delusional belief. Factor 1 is a neuropsychological deficit leading to anomalous perceptions. The resultant explanation for these unusual perceptions may develop into a delusion if a second factor is also present: namely a deficit in belief revision.
The two-factor theory has so far been applied almost exclusively to monothematic delusions – that is, beliefs with a singular theme, such as the Capgras (a loved one is believed to be an impostor) or Cotard (the individual believes they are dead or dying) syndromes.

We begin this monograph with the chapter by myself and Ken Manktelow. We offer a theoretical review of the empirical research on reasoning biases in delusional belief. Our aim is to explore whether such reasoning biases can be integrated with other psychological factors in delusions. In doing this, we present a more comprehensive theory of delusions, which attempts to account for the four stages in delusion formation/maintenance: emergence of the delusional idea; consideration of the tentative delusional hypothesis; selection of evidence and full acceptance; maintenance of the belief.

In Chapter 2, Kengo Miyazono, Lisa Bortolotti and Matthew Broome analyse the apparent impasse between the two-factor theory of Max Coltheart and colleagues (e.g. Davies, Coltheart, Langdon & Breen, 2001; Coltheart, 2007; Coltheart, Menzies & Sutton, 2010) and the prediction-error theory put forward by Corlett and others (Corlett, Taylor, Wang, Fletcher & Krystal, 2010; Fletcher & Frith, 2009). The two-factor theory has stimulated a great deal of research but has been challenged by proponents of the prediction-error theory (Corlett, Taylor, Wang, Fletcher & Krystal, 2010; Fletcher & Frith, 2009). The prediction-error theory contends that a single process underlies both hallucinations and delusions. This process is an excessive or unwarranted prediction error signal, in other words the erroneous detection of a mismatch between what is expected and what is observed. Miyazono, Bortolotti and Broome question whether these two theories may have more in common than in contrast and whether they may indeed be reconciled. Miyazono et al. critically dissect the two theories in order to reveal unique perspectives and new arguments.

Following on from this, in Chapter 3, Rob Dudley, Kate Cavanagh, Kate Daley and Stephen Smith offer an in-depth review of the literature on the jump-to-conclusions bias. Dudley has produced a number of influential research papers on the jump-to-conclusions bias (e.g. Dudley, John, Young & Over, 1997a, 1997b; Dudley & Over, 2003; Dudley et al., 2013) They cast a critical eye over this research field as they ask fundamental questions about the state of knowledge and speculate on future directions for what has become the most widely researched and most reliably replicated reasoning bias in those with delusional beliefs. Chapter 4 by Stephanie Rhodes and Claire Jones asks fundamental questions about the definition of delusions, about the crucial role of affect in delusional reasoning and also about the relevance of dual-process theories of reasoning in relation to delusional thinking. Chapter 5 presents a truly unique perspective on delusions and reasoning by Amelia Gangemi and Valentina Cardella. They advance the argument which contrasts with the now discredited historical view that people with schizophrenia are illogical (Arieti, 1964). They argue that careful analysis of the evidence suggests that such individuals are excessively logical and that their difficulty may stem from an over-reliance on logical reasoning and a deficiency in belief flexibility. The
view that people with delusions do not have a general deficit in reasoning has been around for some time (e.g. Dudley & Over, 2003), but Gangemi and Cardella’s chapter has the potential to change the way we conceptualise the subtle reasoning biases that they do exhibit.

In Chapter 6, we move away from delusions to paranormal beliefs. The interest in reasoning style as a psychological factor in paranormal belief began to take hold in the 1980s (e.g. Alcock & Otis, 1980; Blackmore & Trościanko, 1985; Wierzbiicki, 1985). As with the literature on delusional beliefs, the research field has subsequently blossomed and a large volume of empirical studies on reasoning and other psychological factors in paranormal beliefs now exists. The relevance of this work to that of the preceding sections on delusions is considerable. Paranormal belief may be conceived as a delusional theme and may fall on the delusional continuum (Peters, Joseph, Day & Garety, 2004) and there is evidence that believers in the paranormal are more likely to hold delusional ideas (Hergovich, Schott & Arendasy, 2008). As with delusional belief, there is an abundance of research evidence suggesting that believers in the paranormal are prone to probabilistic biases. A review of this literature is now warranted. Paul Rogers explores this research and evaluates the argument that probabilistic biases in paranormal believers may be indicative not of a wholesale deficit in reason, but rather of a misperception of randomness.

In Chapter 7, Peter J. de Jong provides a review of research into the thinking which underpins phobic danger-beliefs. Following the work of Beck and colleagues (e.g. Beck, Emery & Greenberg, 1985), de Jong has for many years been a leading authority on reasoning in anxiety and phobia, and his work has come to define the field (e.g. de Jong, Mayer & van den Hout, 1997; Smeets, de Jong & Mayer, 2000; Vroling & de Jong, 2009). He presents a dual-process approach involving a reflexive system, which activates threat-related associations and emotions and a rule-based system involving reasoning. The chapter presents an argument for how the rule-based system will tend to confirm and therefore strengthen phobic beliefs, thus perpetuating avoidance of the phobic stimulus. As with the chapter on paranormal belief, this research is also theoretically interrelated to delusional reasoning (Dudley & Over, 2003), especially given the prominent role that anxiety plays in paranoia (see Fowler et al., 2006). This chapter concludes with recommendations for future research priorities and the therapeutic applications of this empirical work. This discussion leads logically to our final chapter, in which Ryan Balzan, Todd Woodward, Mahesh Menon and Steffen Moritz present their metacognitive training (MCT) programme for delusions. Their programme helps clients with delusions to recognise and modify the biased thinking which underlies their beliefs. Balzan et al.’s chapter describes this programme and subsequently outlines its theoretical foundation in the cognitive and social biases which characterise delusions. They finish with a look at the efficacy of the MCT programme as an intervention for patients with delusions. This final chapter then provides a fitting testament to the applied value of the empirical research into beliefs and reasoning which has flourished over the past 25 years or so.
References


1

A PSYCHOLOGICAL MODEL OF DELUSIONAL BELIEF

Integrating reasoning biases with perceptual, self-concept and emotional factors

Niall Galbraith and Ken Manktelow

This chapter attempts to integrate the research on reasoning biases in delusional thinking with other psychological theories of delusion, encompassing the self-concept, perceptions, affect and cognition. The first section will reflect briefly on the nature of delusions and will make a proposal for what a complete theory of delusion formation/maintenance should be able to account for. This will be followed by an outline of psychological theories of delusions, culminating in an in-depth review of the role of reasoning biases in delusional beliefs. The literature on reasoning biases in delusions has afforded a range of theories and a major focus will be on integrating these theories along with other psychological explanations into a coherent model of delusion formation/maintenance. Following this, recommendations for future research will be proposed.

Delusional beliefs

Delusions have been described as the sine qua non of psychosis (e.g. Kemp, Chua, McKenna & David, 1997). They are beliefs which, according to the DSM-5 (APA, 2013) are fixed and resistant to change in the face of conflicting evidence. Delusions are also multidimensional and may be assessed in terms of the degree of distress they bring to the believer, level of preoccupation, degree of conviction and action (Garety & Freeman, 1999). Delusions are most commonly thought of as a symptom of schizophrenia (Tandon & Maj, 2008); however they may also feature in a range of other conditions (e.g. depression; Johnson, Horwath & Weissman, 1991).

Although delusions are normally associated with illness, there is an abundance of literature suggesting that delusions and other features of psychosis can be measured on a continuum ranging from the general population through to the clinical population (Freeman, Pugh, Vorontsova, Antley & Slater, 2010; van...