

**Measurement Issues and the Role of Cognitive Biases in
Conspiracist Ideation**

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A thesis submitted for the degree of Doctor of Philosophy at Goldsmiths, University
of London in October 2013

Statement of Originality

This thesis represents my own original work towards this research degree and contains no material which has been previously submitted for a degree at this University or any other institution, except where due acknowledgement is made.

Robert A. Brotherton

Acknowledgements

My sincerest thanks go to everyone who helped make this thesis what it is:

To my supervisors Chris French (not only the best mentor I could hope for, but a good friend as well), Tomas Chamorro-Premuzic (for guiding the first half of this research), and Alan Pickering (for coming on board later, but having no less input for it). To Pam Heaton and Elisabeth Hill for deciding that this work might be worth funding, and to the Economic and Social Research council for agreeing. To Karen Douglas, who is responsible for my interest in the psychology of conspiracy theories in the first place. To Mark Williams, James Moore, Adrian Furnham, Paul Rogers, Patrick Leman, Rob Teszka, and various peer-reviewers for valuable help, advice, and constructive criticism. Most of all, for unending support and encouragement, to my parents, Ann and Bob, and my partner Lindsay.

And, last but not least, to everyone who participated in this research – particularly those who suspected me of being a government shill.

This work was supported by the Economic and Social Research Council [grant number ES/I90249X]

Related Publications

Some of the work contained within this dissertation has appeared in the following publications.

A version of the section of Chapter 1 concerning the definition of ‘conspiracy theory’ was published in:

Brotherton, R. (2013). Towards a definition of “conspiracy theory.” *PsyPAG Quarterly*, 88(3), 9–14.

A version of Chapter 2, concerning the development of a novel measure of conspiracist ideation, was published in:

Brotherton, R., French, C. C., & Pickering, A. D. (2013). Measuring belief in conspiracy theories: The generic conspiracist beliefs scale. *Frontiers in Personality Science and Individual Differences*, 4: 279.
doi:10.3389/fpsyg.2013.00279

A version of Study 5b, concerning conspiracist ideation and susceptibility to the conjunction fallacy, has been accepted for publication in:

Brotherton, R., & French, C. C. (in press). Belief in conspiracy theories and susceptibility to the conjunction fallacy. *Applied Cognitive Psychology*.

Abstract

Conspiracy theories are a prominent feature of contemporary culture, and can have far-reaching consequences for believers and disbelievers alike. Until recently, however, relatively little research has examined the psychological origins of conspiracist beliefs. A growing amount of research has now begun to reveal the personality, motivational, cognitive, and social factors associated with belief in conspiracy theories. The current thesis aims to contribute to this literature in two main ways.

First, the existing literature is limited by the lack of a validated measurement device. Aiming to address this need, Chapter 2 details the creation of a novel measure of conspiracist ideation, the Generic Conspiracist Beliefs (GCB) scale, from item selection (Study 1) through to psychometric validation (Studies 2, 3, and 4). This measure assesses generic conspiracist ideation, therefore offering greater practical utility and theoretical validity than existing measures which assess endorsement of conspiracy theories based on specific world events.

Second, the literature may benefit from incorporating conspiracism into the wider theoretical framework of anomalistic psychology. Chapters 3 and 4 employ the newly created GCB to investigate the role of representativeness heuristics – according to which claims are judged plausible to the extent that they subjectively appear typical of events in general – in conspiracist ideation. Study 5a predicted that the proportionality bias would influence novel conspiracist attributions; however, the data did not support this hypothesis. Study 5b predicted that susceptibility to the conjunction fallacy would be associated with conspiracist ideation. This hypothesis was supported. Finally, Chapter 4 predicted that conspiracist ideation would be associated with biased attributions of intentionality. Support for this hypothesis was mixed; the findings suggest that an inferential bias towards attributions of intentionality predicts conspiracist ideation, but a perceptual bias does not. In sum, the findings suggest that conspiracist beliefs may be a product, in part, of certain representativeness biases.

Table of Contents

Statement of Originality	2
Acknowledgements	3
Related Publications	4
Abstract	5
Chapter 1. General Introduction	
Overview	12
A brief introduction to conspiracy theories	15
The prevalence of conspiracy theories	15
The consequences of conspiracy theories	18
Towards a working definition of ‘conspiracy theory’	20
The characteristics of conspiracy theories	21
Definition summary	26
Review of the psychological literature	27
Associations between conspiracy beliefs	27
Sociodemographic correlates	31
Individual differences	33
Cognitive biases and heuristics	39
Summary of the literature	46
Limitations and research objectives	47
Research programme	49
Chapter 2. Measuring Belief in Conspiracy Theories: The Creation of a Generic Conspiracist Beliefs Scale	
Introduction	52
Previous approaches towards measuring conspiracist beliefs	53
Measuring generic conspiracist beliefs	55
Overview of the present studies	56
Study 1: Identifying essential facets of conspiracism	57
Method	57
Results	58
Discussion	64
Study 2: Factor structure, reliability & criterion validity	64
Method	65

Table of Contents (continued)

Results	66
Discussion	71
Study 3: Convergent validity and additional evidence of criterion-related validity	72
Method	72
Results	74
Discussion	75
Study 4: Discriminant validity	75
Method	76
Results	77
Discussion	78
General discussion	79
Summary and conclusions	82

Chapter 3. Conspiracy Theories and Judgements by Representativeness: The Proportionality Bias and the Conjunction Fallacy

Introduction	84
The representativeness heuristic	84
Representativeness and judgements of causality	86
Representativeness and anomalous beliefs	87
Overview of the current studies	88
Study 5a: Belief in conspiracy theories and the proportionality bias	90
Introduction	90
Method	92
Results	95
Discussion	97
Study 5b: Belief in conspiracy theories and susceptibility to the conjunction fallacy	100
Introduction	100
Method	103
Results	105
Discussion	107
General discussion	110

Table of Contents (continued)

Chapter 4. Representativeness Continued: Conspiracist Ideation and Judgements of Intentionality	
Introduction	112
Inferring intent	112
Overattribution of intentionality	114
Intentionality and conspiracy theories	116
Overview of studies	118
Study 5c: Conspiracist ideation and inferences of intentionality	119
Method	119
Results	121
Discussion	124
Study 6: Conspiracist ideation and perceived intentionality	125
Method	125
Results	127
Discussion	129
Study 7: Individual differences in anthropomorphisation	130
Method	131
Results	132
Discussion	133
Study 8: Associations between anthropomorphisation and intentional inferences	133
Method	133
Results	135
Discussion	136
General discussion	138
Summary and conclusions	142
Chapter 5. General Discussion	
Purposes and key findings of the present research	144
Background and rationale	144
Key findings	147
Summary and implications	150
Research limitations	153
Future directions	157

Table of Contents (continued)

Conclusion	160
References	161
Appendix 2.1. Item-loadings for the alternative 6-factor solution in Study 1	182
Appendix 2.2. GCB scale instructions and item wording	185
Appendix 3.1. Proportionality bias instructions and vignette wording	186
Appendix 3.2. Wording of novel conspiracy-themed conjunction items	187

List of Tables

- 2.1. Comparison of results of EFA Eigenvalues with PA Eigenvalues.
 - 2.2. Conspiracist Beliefs Scale (long-form) items and factor loadings.
 - 2.3. Correlations between factor scores and overall Conspiracist Beliefs Scale (long-form) score.
 - 2.4. GCB scale items and standardised factor loadings obtained with exploratory factor analysis.
 - 2.5. Item standardised factor loadings obtained with confirmatory factor analysis.
 - 2.6. Correlations between latent variables.
 - 2.7. Multicollinearity diagnostics for regression model.
 - 2.8. Results of multiple regression analysis with GCB factor scores predicting 9/11 conspiracist beliefs.
 - 2.9. Means, standard deviations, and interscale correlations for Study 3.
 - 2.10. Means, standard deviations, and interscale correlations for Study 4.
-
- 3.1. Mean ratings for likelihood of statements being true (standard deviations in parentheses), and MANOVA results.
-
- 4.1. Results of multiple regression with intentional inferences and anthropomorphism predicting conspiracist ideation.

List of Figures

- 3.1. Average number of conjunction fallacy errors for each item type by belief group.

- 4.1. Scatterplot of number of inferences of intentionality against conspiracist ideation (GCB scores).
- 4.2. Average number of inferences of intentionality among quartile groups derived from GCB scores (lowest to highest).
- 4.3. Schematic illustration of key-pressing apparatus.
- 4.4. Scatterplot of GCB scores against number of intentional attributions.
- 4.5. Scatterplot of anthropomorphism (IDAQ scores) scores against conspiracist ideation (GCB scores).

Chapter 1

General Introduction

Overview

According to conspiracy theorists, the terrorist attacks of September 11th, 2001, were orchestrated not by members of al-Qaeda, but by the United States government (Stempel, Hargrove, & Stempel, 2007); Princess Diana's death was the result not of a tragic accident, but of a secret plot concocted by the British Monarchy (Gardiner & Thompson, 2012); and government-run water treatment programmes are designed not simply to provide potable drinking water, but to spike the water with chemicals intended to control or kill the general public (Williams, 2013). Why is it that people believe implausible and unsubstantiated claims such as these to be true? The aim of the present thesis is to advance the body of psychological research seeking answers to this question.

One possible reason for the prevalence of belief in conspiracy theories is that the theories are true, and believers derive their opinions from rational and impartial evaluation of the evidence supporting the claims. Information presented as evidence supporting many of the most popular conspiracy theories is readily available. Many theories generate their own cottage industry of books, websites, speaking tours, and documentaries (see Byford, 2011). However, the same evidence is generally criticised by credentialed experts as being of poor quality; conspiracy theories are generally regarded by the relevant communities of legitimate epistemic authorities as being unverified and lacking credibility, at best, or conclusively disconfirmed by multiple lines of converging evidence, at worst (e.g. Dunbar & Reagan, 2006; Posner, 1994). Although perhaps outnumbered by proconspiracist sources, critical analyses of various conspiracy theories are nonetheless readily available in print, broadcast media, and online.

Regardless of the ultimate evidential basis for or against any particular conspiracist claim, there are other indications that beliefs in conspiracy theories might not be simply the product of reasoned scrutiny of the facts. Conspiracy theories are often quick to arise following an event, becoming widely endorsed even before many of the facts can be ascertained and analysed (e.g. Birdwell & Littler, 2011); indeed, the theories often actively foster the perception that the truth is

currently unknown (Popp, 2006). In addition, individuals who endorse one conspiracy theory tend to endorse many other ostensibly unrelated theories (Goertzel, 1994; Lewandowsky, Oberauer, & Gignac, 2013; Swami & Furnham, 2012; Swami et al., 2013; Wood & Douglas, 2013). Certain individuals will even endorse mutually contradictory conspiracy theories (Wood, Douglas, & Sutton, 2012) and entirely novel, fictitious theories made up by researchers (Swami et al., 2011). Moreover, conspiracy theories are inherently implausible, diverging from reality, as it is normally understood, in certain fundamental ways; these characteristics will be explored in greater detail in a later section of the current chapter (*Towards a definition of 'conspiracy theory'*).

These observations do not in themselves indicate that any particular conspiracy theory is necessarily false; in the context of psychological enquiry the veracity of any particular conspiracy theory is not at issue. However, the observations do suggest that conspiracist beliefs may be, at least in part, the product of factors other than impartial examination of the evidence. Whether or not any given conspiracy theory accurately describes reality, it appears likely that psychological factors influence the formation, maintenance, and transmission of conspiracist beliefs.

Until recently, however, the phenomenon of conspiracy theorising attracted relatively little interest from psychologists. Between the late-1970s and 2007, only a sporadic trickle of studies on the psychology of conspiracy theories was published (Abalakina-Paap, Stephan, Craig, & Gregory, 1999; Bird & Bogart, 2003; Butler, Koopman, & Zimbardo, 1995; Goertzel, 1994; Leman & Cinnirella, 2007; McCauley & Jacques, 1979; McHoskey, 1995; Parsons, Simmons, Shinhoster, & Kilburn, 1999; Simmons & Parsons, 2005). It is only within the last few years that conspiracist beliefs have begun to attract the sustained interest of a larger number of researchers; a greater number of studies have been published within the past five years alone than all earlier studies combined. This body of research has begun to reveal the role of personality, motivational, and cognitive factors, suggesting that psychology can provide important insights into conspiracism. However, despite the increasing number of publications, research on the topic remains somewhat unfocused. In particular, efforts to measure conspiracist ideation have been piecemeal, and the literature is lacking a firm theory-driven investigative approach.

The primary aim of the current thesis is to add to this growing literature in two specific ways. First, by drawing upon recent theoretical insights concerning the hierarchical structure of conspiracist beliefs (Wood et al., 2012; Wood & Douglas, 2013), a series of studies will be reported with the aim of presenting a psychometrically valid and practically useful measure of individual differences in generic conspiracist ideation. Second, by taking the wider anomalistic psychology literature as a starting point (French & Stone, 2014), the thesis will explore the role of the representativeness heuristic (see Gilovich & Savitsky, 2002; LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; Lupfer & Layman, 1996; Rogers, Davis, & Fisk, 2009; Rogers, Fisk, & Wiltshire, 2011) in endorsement of conspiracy theories. This heuristic, first explored by Kahneman and Tversky (1972; see also Tversky & Kahneman, 1982), describes a cognitive shortcut whereby the plausibility of a hypothesis or outcome is evaluated in terms of whether its key characteristics subjectively appear similar to the parent population – that is, the category of events or explanations of which it is an exemplar – and how well it reflects the characteristics of the process by which it was generated. Thus, random processes are expected to produce random-seeming outcomes, and the products of a particular process are expected to be highly similar to one another. Since reality often fails to satisfy these representativeness assumptions, the heuristic can lead to systematically flawed judgements. This thesis explores the ideas that conspiracy theories may appear more representative to individuals prone to specific proportionality, conjunction, and intentionality biases.

To justify these research aims, this opening chapter aims to present a broad introduction to the phenomenon of conspiracism. The first section of this chapter (*A brief introduction to conspiracy theories*) will present a brief overview of the prevalence of conspiracy theories in contemporary culture, the historical roots of conspiracy theorising, and the behavioural consequences which conspiracist beliefs can entail, with the aim of establishing why it is that conspiracy theories are deserving of psychological study. The next section (*Towards a working definition of 'conspiracy theory'*) will address the absence of a satisfactory definition of the term 'conspiracy theory', and will attempt to articulate a comprehensive working definition. Having delineated the object of enquiry, the next section (*Review of the psychological literature*) will then review the relevant psychological literature to date. Existing findings will be organised into a coherent categorical framework and

limitations of this body of research will be discussed, serving to explain the rationale driving the present research aims. Finally, a succinct overview of the planned programme of research will be presented (*Overview of research programme*).

A brief introduction to conspiracy theories

The prevalence of conspiracy theories

It is not difficult to evidence the current popularity of conspiracy theories. According to various opinion polls and academic surveys, a majority of the American public doubts that President John F. Kennedy was killed by a lone gunman (Goertzel, 1994; McHoskey, 1995), approximately one-third believes that the terrorist attacks of September 11th, 2001, were the product of conspiracy within the US government (Stempel et al., 2007), and around one-quarter of Britons believe that Princess Diana was assassinated (Gardiner & Thompson, 2012). Conspiracy theorising is not limited to Britain and the US; substantial numbers of people around the world readily admit to believing various conspiracy theories (Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013; Byford, 2011; Pipes, 1997; Stieger, Tran, & Swami, 2013; Sunstein & Vermeule, 2009; Swami et al., 2011).

Other popular theories, to name but a few, allege that the US or British governments are covering up evidence of extraterrestrial visitation (believed by 21% of Americans and 15% of Britons); that the 1969 Apollo moon landing was faked (supported by 7% of Americans and 15% of Britons); that anthropogenic climate change is a scientific fraud (endorsed by 37% of Americans); that the pharmaceutical industry promotes harmful products in pursuit of profits (believed by 20% of Americans); and that a nefarious secret society has for generations been manipulating world events from behind the scenes (believed by 28% of the American public) (see Gardiner & Thompson, 2012; McConnachie & Tudge, 2008; Whalen & Vankin, 2004; Williams, 2013). From meteorological anomalies and natural disasters to mass shootings, bombings, and other terrorist activities, it is rare that a significant event in the world today does not generate at least a modicum of conspiracy theorising (Byford, 2011).

The proliferation of conspiracy theorising in contemporary culture is reflected in (and reciprocally fuelled by) the widespread dissemination of conspiracist claims in popular media. In recent years, many books claiming to reveal nefarious

conspiracies have been published by mainstream publishers, achieving commercial success and appearing on nonfiction best seller lists around the world (see Byford, 2011). On television, conspiracy theories are often presented sympathetically in a genre which has been called ‘speculative history’ (Popp, 2006). In the realm of fiction, conspiratorial plots commonly feature in mainstream blockbusters such as *The Da Vinci Code*, the *Bourne* trilogy, *Anonymous*, and in television series such as *The X-Files* and *Homeland*. In addition, the internet abounds with websites, blogs, podcasts, forums, YouTube videos, and freely available feature-length documentaries espousing various conspiracy theories (Clarke, 2007; Wood, 2013).

The sheer prevalence and visibility of conspiracy theories in contemporary culture may give the impression that conspiracy theorising is a distinctly modern phenomenon. Possibly adding to this perception is the fact that conspiracism has only garnered sustained critical scholarly attention since the mid-20th century (Hofstadter, 1964; Popper, 1952). Popular media coverage of conspiracy theories as a phenomenon in their own right, including routine opinion polls revealing the prevalence of conspiracist beliefs, blossomed in the 1990s and early 2000s (Bratich, 2008; Byford, 2011). Despite the relative recency of this cultural preoccupation with conspiracism, however, conspiracy theorising is far from an exclusively modern pastime.

On the contrary, allegations of conspiracy were abundant among the speeches and writings of ancient Athens and Rome, and throughout the Middle Ages (Byford, 2011; Coward & Swann, 2004; Roisman, 2006). Conspiracy culture truly came of age, however, near the end of the 18th century in the aftermath of the French Revolution (Hofstadter, 1964). Two books published in 1797 each claimed that the French Revolution was the result of a nefarious conspiracy perpetrated by a confluence of sinister secret societies – primarily the Illuminati (Barruel, 1797, and Robison, 1797, cited in Byford, 2011). The Bavarian Illuminati was a small, relatively obscure group that had formed in 1776 and disbanded just 10 years later – three years before the French Revolution had begun (Byford, 2011). Yet, according to the author of one of these seminal books, not only had the Illuminati orchestrated the French Revolution, but the group had been formed for “the express purpose of rooting out all religious establishments, and overturning all the existing governments of Europe” (Robison, 1797, cited in Hofstadter, 2008, p. 11).

This signified a move from what had previously been theories about rather limited and petty conspiracies of self-interest, to altogether grander theories about more mysterious, subversive, and monolithic conspiracies said to be working towards less tangible, but more sinister, ends (Cubitt, 1989). In this new form conspiracy theories were able to explain everything that happened in the world as the product of an all-encompassing conspiracy determined to somehow undermine or overthrow a way of life (Byford, 2011).

Throughout the 19th and 20th Centuries, and up to the present day, conspiracy theories have drawn upon these same narrative tropes and rhetorical styles (Byford, 2011). Just as contemporary conspiracy theories allege a ‘New World Order’ plot to usurp current governments, the founders of the United States feared British and French conspiracies to overthrow and enslave the new republic (Byford, 2011). Antivaccinationists in mid-19th century England accused vaccination practitioners and advocates of conspiring to incite fear, increase their own status, ensure profits, and poison the people they claimed to be protecting (Durbach, 2005) – ideas that are mirrored in current conspiracist allegations directed against ‘Big Pharma’ (Offit, 2011; Wolfe & Sharp, 2002). In the early 20th century, *The Protocols of the Elders of Zion* – an anti-Semitic publication which generated interest around the world – claimed to reveal a Jewish plot of world domination akin to the Illuminati conspiracy theories popularised a century earlier (Aaronovitch, 2009). Likewise, currently popular conspiracist accounts of the 9/11 terrorist attacks, which theorists claim the Bush government purposefully failed to prevent, share the essential narrative of theories popularised in the 1940s accusing President Franklin D. Roosevelt of deliberately permitting the Japanese attack on Pearl Harbor which precipitated the US’s involvement in the Second World War (Byford, 2011).

This abridged history offers just a few examples of conspiracy theories which have been readily accepted by large numbers of people in various countries and at various times over the past few centuries. It is clear that grandiose tales of conspiracy have been a constant feature of human culture throughout history, and that conspiracy theories have maintained a distinct rhetorical and narrative style since the late 18th century (Byford, 2011). The recent digital revolution may have hastened the formulation and spread of conspiracy theories, making them more easily available to a larger audience than ever before (Clarke, 2007; Wood, 2013). Yet the conspiracism of the 21st century is not a uniquely modern phenomenon, but rather the natural

extension of a long conspiracist tradition. This tradition – the characteristic features of conspiracy theories – will be explored in greater detail later in this chapter (*Towards a definition of ‘conspiracy theory’*). First, however, it is necessary to explore the consequences of conspiracism.

The consequences of conspiracy theories

Conspiracy theories are sometimes regarded as a harmless diversion, or even a potentially beneficial safeguard against real conspiratorial activity going undiscovered (e.g. Clarke, 2002; Pigden, 2007). The notion that the investigative activity of conspiracy theorists serves to uncover real disreputable behaviour appears to be a dubious assertion; where genuine conspiracies have been uncovered in recent years, such as the Watergate or Iran-Contra scandals, it has been due to the efforts of conventional journalists and academics or whistle blowers, rather than obscure conspiracy theorists (e.g. Draper, 1992; Woodward & Bernstein, 1974). However, it is with the notion that conspiracy theories are largely harmless that this section aims to take issue. Rather than being “just harmless fun” (Jolley, 2013, p. 60), widespread belief in conspiracy theories can have tangible detrimental consequences, both for the individuals who believe the theories, and for the wider community.

One domain in which conspiracy theories can have harmful consequences is in terms of people’s health choices. The most extensively researched example to date concerns beliefs about HIV/AIDS. It is variously claimed that AIDS is caused not by the HIV virus, but by recreational drug use or sexual behaviour; that AIDS treatment programs are ineffective or actively harmful; or that the HIV virus was created by the US government and deliberately disseminated among certain communities as an agent of population control. Substantial numbers of people endorse these ideas – particularly African Americans, who are often portrayed as the victims of the alleged conspiracy (see Bird & Bogart, 2005). Those who believe these theories – including HIV-positive individuals – are less likely to use preventative measures or adhere to treatment programs (e.g. Bogart, Galvan, Wagner, & Klein, 2011; Bogart, Wagner, Galvan, & Banks, 2010). It is not only the general public whose actions are affected. In 1999, in the midst of an AIDS epidemic, the South African government declined donations of antiretroviral medication for AIDS patients, arguing that the drug was ineffective and toxic. It is estimated that, between 2000 and 2005, the deaths of more than 330,000 South African AIDS patients could have been prevented if access to

effective treatment not been obstructed (Chigwedere, Seage, Gruskin, Lee, & Essex, 2008).

Likewise, conspiracy theories have surrounded the practice of vaccination since the advent of the first vaccine. In the mid-19th century, laws compelling parents to vaccinate their children against smallpox spawned dedicated antivaccination leagues across England. These groups argued that the severity of the disease and the efficacy of vaccination were exaggerated by doctors intent on increasing their own profits (Fitchett & Heymann, 2011; Offit, 2011). These antivaccination movements gathered sufficient popular support to force Parliament to overturn compulsory vaccination laws, resulting in a resurgence of smallpox (Allen, 2008). Contemporary conspiracy theories regarding vaccines make virtually identical claims, arguing that vaccines are toxic and that the medical industry, government, and Big Pharma are colluding to conceal evidence of harm and ensure profitability (Offit, 2011; Wolfe & Sharp, 2002). These allegations have played a role in declining uptake of vaccines (Barrelet, Bourrier, Burton-Jeangros, & Schindler, 2013; Chung, 2009; Gerber & Offit, 2009; Hilton, Petticrew, & Hunt, 2007; Kata, 2010, 2012; Salmon et al., 2005), which in turn has contributed to epidemics of vaccine-preventable diseases (Jansen et al., 2003).

It is not only in the domain of personal health choices that conspiracy theories can lead to negative outcomes. Mere exposure to climate change conspiracy theories has been shown to reduce participants' intentions to reduce their carbon footprint (Jolley & Douglas, 2013). Conspiracy theories denying the reality of anthropogenic climate change may even have an influence on political policy making; in February 2010, politicians in the US formulated a resolution recommending the withdrawal of carbon dioxide emission restrictions, explicitly endorsing the conspiracy theory that scientists are manipulating climate data to produce a global climate change outcome (State of Utah, 2010).

More generally, there is some evidence that conspiracy theories can lead to disengagement from mainstream politics (Butler et al., 1995; Jolley & Douglas, 2013). There are indications that this sense of political powerlessness may motivate social action aimed at challenging traditional authorities, such as protesting (Imhoff & Bruder, 2013). However, in some cases conspiracist beliefs can foster restrictive attitudes towards human rights (Swami et al., 2012). This can extend to radicalisation and extremism. One qualitative analysis found that conspiracy theories commonly

feature within the ideologies of extremist and terrorist organisations, such as al-Qaeda and Aryan Nations (Bartlett & Miller, 2010). Individual perpetrators of various attacks have apparently been influenced by conspiracy theories (see Byford, 2011), including Timothy McVeigh (Michel & Herbeck, 2001), Anders Brevich (Fekete, 2012), and Tamerlan Tsarnaev (Andersson, 2013).

Of course, the consequences of conspiracy theories are unlikely to be entirely negative. Such beliefs may serve important functions for believers, conferring a sense of control, meaning, and understanding in the face of threatening events, and potentially providing believers with a supportive social community (Franks, Bangerter, & Bauer, 2013). However, given the demonstrable harm that widespread belief in conspiracy theories can cause, it is important to understand how such beliefs arise. Before turning to the psychology of conspiracism, however, it is necessary to demarcate the object of enquiry – that is, to articulate a working definition of ‘conspiracy theory’.

Towards a working definition of ‘conspiracy theory’

To understand the psychological origins of conspiracy theories, researchers need to be clear about what is meant by the term ‘*conspiracy theory*’. The phrase is firmly embedded in the contemporary lexicon. As of May 2013, a Google search for ‘conspiracy theory’ returns almost 10 million results. It is used by politicians, journalists, academics, and the general public alike to refer to particular claims or narratives. For the most part, the label is applied consistently; there is general agreement over which claims qualify as conspiracy theories and which do not (Byford, 2011; Keeley, 1999). Conspiratorial explanations of the Apollo moon landings, the spread of HIV/AIDS, and the death of President John F. Kennedy, to name but a few prominent examples, are all commonly categorised as conspiracy theories in popular discourse (see McConnachie & Tudge, 2008).

However, ‘conspiracy theory’ is a deceptively simple term. Though it is widely used, articulating what it is that makes one claim a conspiracy theory but not another presents unexpected difficulties (Keeley, 1999). The claim that members of the US government were complicit in the attacks of September 11th, 2001, for instance, is generally branded a conspiracy theory (e.g. Dunbar & Reagan, 2006; Grossman, 2006), yet the label is rarely applied to the claim that members of al-Qaeda secretly planned and executed the attacks. These two claims both postulate a

successful conspiracy to commit the attacks. Why is it that, in popular discourse, the term conspiracy theory is applied to the former but not the latter?

The features which distinguish conspiracy theories from legitimate theorised conspiracies are not immediately obvious. Dictionary definitions (e.g. Thompson, 1995) fail to capture the nuanced meaning that the term conveys in common use. Psychologists researching conspiracist beliefs have generally avoided the task of articulating a definition altogether (e.g. Butler et al., 1995), or have sketched out brief, relatively superficial definitions (e.g. Swami et al., 2013; Whitson & Galinsky, 2008; Zonis & Joseph, 1994) with the unspoken assumption that the distinction between conspiracy theories and other claims is self-evident (Byford, 2011). The situation has been likened to attempting to define pornography – a task which forced US Supreme Court Justice Potter Stuart to conclude simply, “I know it when I see it” (Byford, 2011, p. 31). The frequency and consistency with which the label ‘conspiracy theory’ is used in popular discourse suggests that users feel sufficiently confident that they know a conspiracy theory when they see it. Yet for the purposes of scientific scrutiny, it is necessary to stipulate a working definition which articulates these unspoken assumptions about the characteristics that identify a claim as being a conspiracy theory.

The characteristics of conspiracy theories

The current definition is not concerned with the linguistic origins of the words ‘conspiracy’ and ‘theory’, nor with the specific meaning of ‘conspiracy’ in a legal context – it is concerned only with capturing the meaning conveyed by the term ‘conspiracy theory’ in contemporary popular discourse (see Cubitt, 1989). In popular use, the label ‘conspiracy theory’ refers to a special type of postulated conspiracy. These conspiracies tend to depart from legitimate claims of conspiracy in several regards. The following section will attempt to identify and describe these characteristics by taking a family-resemblance approach, focusing on features of the context in which such claims exist, their content, and their epistemic rationale. A conspiracy theory will be defined as an unverified claim of conspiracy which is not the most plausible account of an event or situation, pertains to significant events or has sensationalistic implications, assumes unusually sinister and competent conspirators, is based on weak kinds of evidence, and is epistemically self-insulating against disconfirmation. Each of these characteristics will be examined in turn.

Context.

Conspiracy theories are unverified claims. Conspiracies have occurred throughout history, and occur in some form every day – in politics, organised crime, insider dealing, scams, and so on. Philosopher Charles Pigden points out that, “if a conspiracy theory is simply a theory which posits a conspiracy, then every politically and historically literate person is a big-time conspiracy theorist” (Pigden, 2007, p. 222). However, this is not how the label is commonly used. The term, as used in popular discourse, usually refers to explanations which are not regarded as verified by legitimate epistemic authorities. The theory may be regarded as indisputably true by those who subscribe to it, but this belief is invariably at odds with the mainstream consensus among scientists, historians, or other legitimate judges of the claim’s veracity.

This is partly a matter of empirical support. The evidence offered in favour of a conspiracy theory is generally perceived as deficient by epistemic authorities (e.g. Dunbar & Reagan, 2006; Posner, 1994). However, in addition to the lack of well-regarded evidence, the theories themselves often hinge on the fact that they are not widely accepted by the mainstream. Inherent in most conspiracy theories is the allegation that the conspiracy is ongoing, and thus is yet to be fully revealed and verified (Goertzel, 2010). In this way, conspiracy theories actively cultivate the perception that events are unsolved by searching for ambiguity and arguing that all is not as it seems (Popp, 2006).

Conspiracy theories are less plausible alternatives to the mainstream explanation. Conspiracy theories are defined in part by their oppositional relationship with other explanations of the events or situations to which they pertain (Aaronovitch, 2009; Coady, 2006; Keeley, 1999; Oliver & Wood, 2012). A conspiracy theory is not merely one candidate explanation among other equally plausible alternatives. Rather, the label refers to a claim which runs counter to a more plausible and widely accepted account. Conspiracy theories invariably reject this mainstream explanation as being false.

In conspiracist rhetoric, the mainstream explanation is usually termed the ‘official story’. This disparaging label is intended to imply that the explanation is merely an account that happens to be proffered by some official source, and so should not be trusted; the mainstream explanation is construed as not merely a mistaken hypothesis, but as a deliberate fraud concocted by the conspirators to

mislead the public (Barkun, 2003; Goertzel, 2010). Thus the very existence of an official story is incorporated into the conspiracy theory and said to be evidence of a conscious plot to deceive the public – ‘that’s what they *want* us to believe’ (Fenster, 2008; Keeley, 1999). Indeed, a conspiracy theory need not offer a coherent, detailed alternative explanation for events; it may simply be based around the allegation that *something* is wrong with the official story (Wood et al., 2012; Wood & Douglas, 2013).

Conspiracy theories are sensationalistic. Not all events are equally likely to become the subject of a conspiracy theory. Of the many historically documented conspiracies, and the many more which are undoubtedly occurring at this very moment, most are clearly limited in ambition and consequence. Typical conspiracies have mundane aims, such as profiteering or concealing some petty crime, and have localised consequences. Conspiracy theories, however, rarely concern these kinds of isolated and relatively unimportant events. Typically only events of obvious national or international significance attract conspiracy theories, such as terrorist attacks, natural disasters, disease pandemics, the deaths of celebrities, and plane crashes (Byford, 2011). These kinds of events are often profoundly shocking, have a large impact on public consciousness, and receive extensive media coverage.

In addition to their significant subject matter, conspiracy theories have sensational implications. According to such claims, our basic knowledge of current events and world history is based on a fabrication (Keeley, 1999). It is often the organisations and institutions that are normally expected to be accountable and acting in the public interest, such as democratically elected leaders, health care providers, and the media, that are portrayed as wantonly deceiving those who rely on them. If such claims were true there would often be profound implications for our understanding of freedom, liberty, privacy, knowledge, political transparency, and even free will. In many cases vindication of the claims would justify the impeachment of whole governments, the disbandment and criminal prosecution of entire organisations and industries, and the rewriting of history (Byford, 2011).

Content.

Conspiracy theories assume that everything is intended. In the real world, conspiracies – even relatively simple, petty, straightforward plans – rarely work out exactly according to plan or remain undetected for long (Byford, 2011). In contrast, conspiracy theories posit an ordered world in which conspiracies are preternaturally

successful; the competence and discretion of individuals, coalitions and bureaucracies is greatly overstated. According to conspiracy theories almost nothing happens by accident, only by agency (Barkun, 2003). Events and situations are explained not as a result of many different complex, chaotic, interacting, and uncontrollable factors, but solely as the result of the conspirators' desires and actions. Every observed detail is said to have resulted from conscious planning, direct intervention, manipulation, and deception. The potential role of chance, accidents, and unintended consequences is largely overlooked. Rather, the conspirators are assumed to be hypercompetent in their ability to successfully plan and control events and subsequently keep secret their actions (Byford, 2011; Popp, 2006; Popper, 2006).

Conspiracy theories assume unusually malign intent. While the act of conspiracy necessarily entails some element of secrecy, not all conspiracies are malevolent. In the real world, conspiracy is sometimes necessary and benign. Consider the routine operations of intelligence agencies in the interests of national security, or a group of people conspiring to throw a surprise party for a friend. Of course, cruel and destructive conspiracies do take place in the world, but even these tend to be limited in ambition and scope. The type of claims typically referred to as conspiracy theories invariably posit an altogether more sinister type of conspirator (Keeley, 1999; Kramer, 1998; Lewandowsky, Cook, Oberauer, & Marriott, 2013; Moscovici, 1987).

The malevolent intent assumed by most conspiracy theories goes far beyond everyday plots borne out of self-interest, corruption, cruelty, and criminality. The postulated conspirators are not merely people with selfish agendas or differing values (Bale, 2007). Rather, conspiracy theories postulate a black and white world in which good is struggling against evil (Bale, 2007; Barkun, 2003; Oliver & Wood, 2012). The general public is cast as the victim of organised persecution, and the motives of the alleged conspirators often verge on pure maniacal evil (Lewandowsky, Cook, et al., 2013). At the very least, the conspirators are said to have an almost inhuman disregard for the basic liberty and well-being of the general population. More grandiose conspiracy theories portray the conspirators as being Evil Incarnate – of having caused all the ills from which we suffer, committing abominable acts of unthinkable cruelty on a routine basis, and striving ultimately to subvert or destroy

everything we hold dear (Bale, 2007; Hofstadter, 2008; Moscovici, 1987; Popper, 2006).

Epistemic rationale.

Conspiracy theories have low standards of evidence. Richard Hofstadter noted the “heroic strivings” with which conspiracy theorists seek out evidence in favour of their claims (Hofstadter, 2008, p. 36). This is perhaps even more obvious today, with entire online cottage industries devoted to particular conspiracy theories. However, not all evidence is treated equally. Conspiracy theories can be identified by the types of evidence that they are predicated on.

Conspiracy theories are primarily built upon negative evidence – gaps or ambiguities in current knowledge. An alternative narrative is constructed out of what is perceived to be *errant data* (Keeley, 1999). This term refers to details which are either unaccounted for by the mainstream explanation, or which seemingly contradict it. Such anomalies are rarely regarded by epistemic experts as sufficient to undermine the mainstream explanation in its entirety; in fact, they are usually seen as irrelevant or invented, or at least equally consistent with other explanations (Dunbar & Reagan, 2006; Lewandowsky, Cook, et al., 2013). Yet conspiracy theories take these errant details and weave them into a coherent narrative. Every anomaly is interpreted as part of a singular conspiracy, rather than simply an isolated unanswered question or an irrelevant spurious factoid. The mere existence of anomalies is argued to be compelling evidence that the mainstream explanation is a falsehood, and therefore that a conspiratorial explanation must be true.

When positive evidence is presented in favour of a conspiracy theory, it is generally regarded by legitimate epistemic authorities as being of low quality. Conspiracy theories often rely upon the testimony of eyewitnesses caught up in chaotic and traumatic events, for example (Dunbar & Reagan, 2006). This kind of evidence is valued above subsequent methodical investigations, despite the abundance of psychological evidence pointing out the unreliability of eyewitness testimony (e.g. Wells & Olson, 2003).

Conspiracy theories are epistemically self-insulating. Because of their epistemic approach towards new information, conspiracy theories are insulated against questioning or refutation. The unparalleled evil and power of the postulated conspirators implies that they have virtually unlimited ability to control people and information. Thus, the continued failure of those in the mainstream to discover or

expose the conspiracy can be interpreted as evidence of their complicity in the plot. This epistemic strategy has been termed *cascade logic*, referring to the tendency for conspiracy theories to remain viable hypotheses by implicating more and more people in the alleged scheme (Goertzel, 2010; Sunstein & Vermeule, 2009). In this way, conspiracy theories are able to incorporate any inconvenient data: the absence of substantiating evidence is interpreted as evidence of a conspiracy of silence, while evidence directly contradicting the theory can be seen as disinformation concocted by the conspirators as part of their cover-up.

By invoking the epistemic rationale of ‘heads I win, tails you lose’ (Boudry & Braeckman, 2012; Wiseman, 2010), conspiracy theories seal themselves off from respectful and impartial examination of all the evidence, and are ultimately unfalsifiable. As contrary information can be reinterpreted to fit with the conspiracy theory, providing credible evidence against a claim can even have the unintended consequence of reinforcing it (Goertzel, 2010; Keeley, 1999).

Definition summary

‘*Conspiracy theory*’ is the name commonly given to a particular category of claims: a subset of theorised conspiracies which reliably demonstrate certain characteristics. In terms of the context in which conspiracy theories exist, a conspiracy theory is an unverified and sensationalistic claim of conspiracy which contradicts a more plausible account. In terms of content, the claim assumes extraordinary malevolence and competence on the part of the conspirators. In terms of epistemic rationale, the claim is based on evidence regarded as poor quality by legitimate epistemic authorities, and is resistant to questioning or refutation.

Individually, each of these features is typical of conspiracy theories, but not unique to them. It is the confluence of all these features that identifies the most prototypical conspiracy theories. However, it is important to acknowledge the limitations of these criteria. There is huge diversity amongst conspiracy theories; not all conspiracy theories manifest these attributes in precisely the same way or to the same extent. Moreover, most of the characteristics outlined here are not objective criteria; classifying a claim as a conspiracy theory unavoidably requires an element of subjective judgement and discretion. Yet even with these caveats in mind, the family-resemblance approach taken here appears to offer a useful definition of

conspiracy theory as it is used in popular discourse, and thus allows the object of scrutiny to be adequately delineated.

Review of the psychological literature

Having outlined the prevalence and consequences of conspiracy theories, and provided a sufficient working definition, it is now possible to proceed towards an overview of the existing psychological literature. The purpose of this review is to examine the relevant psychological literature to date, with the objective of systematizing the available data in order to suggest fruitful lines of future enquiry. For the purposes of this review, the existing research will be divided into four categories – *Associations between conspiracy beliefs*, *Sociodemographic correlates*, *Individual differences*, and *Cognitive biases and heuristics*. It should be noted that these categories do not denote mutually exclusive categories or rigid psychological divisions, but are intended as convenient subheadings which serve to organise existing findings into a meaningful framework.

Associations between conspiracy beliefs

One of the most robust findings to emerge from the available literature concerns the relationships *between* various conspiracist beliefs: belief in one conspiracy theory correlates with belief in other conspiracy theories (e.g Goertzel, 1994; Swami et al., 2011; Wood et al., 2012). Thus, belief in conspiracy theories can be conceptualised as a ‘monological’ belief system (Goertzel, 1994), or a singular personality trait. This trait – the extent to which an individual tends to accept or reject conspiracy theories in general – has been termed *conspiracist ideation* (Swami et al., 2011). The degree to which an individual will endorse any particular conspiracy theory can be predicted by stable individual differences in general conspiracist ideation.

This ought to be somewhat surprising. The question of whether the historic footage of Neil Armstrong’s giant leap for mankind was shot on the surface of the moon or in a terrestrial film studio is unrelated in any obvious sense to the possibility that Queen Elizabeth II, George W. Bush, and other powerful figures from throughout history are in fact descended from shape shifting alien lizards bent on world domination. These separate issues each deserve impartial evaluation of the relevant evidence, and presumably an individual might assign each claim a different

degree of plausibility based on independent evidential merit. Yet individuals who endorse one conspiracy theory tend also to endorse many others.

Several studies within the psychological literature have used factor analysis and indicators of scale reliability to examine the structure of measures of general conspiracist ideation. Most existing measures have been composed of between 6 and 30 items, with each item referring to a different popular conspiracy theory. Theories commonly referred to include, for example, the deaths of President John F. Kennedy and Princess Diana, and the origin of AIDS. Despite the variety in item content, factor analyses have found several such measures to have a single-factor structure (Bruder et al., 2013; Goertzel, 1994; Imhoff & Bruder, 2013; Swami et al., 2011; Swami, Chamorro-Premuzic, & Furnham, 2010). In addition, most existing measures have demonstrated high internal reliability as assessed by Cronbach's alpha, further indicating that conspiracist ideation constitutes a unidimensional construct (Abalakina-Paap et al., 1999; Crocker, Luhtanen, Broadnax, & Blaine, 1999; Darwin, Neave, & Holmes, 2011; Douglas & Sutton, 2011; Goertzel, 1994; Leman & Cinnirella, 2007; Swami et al., 2011, 2010; Wood et al., 2012).

It should be noted that some scales have not demonstrated a single-factor structure. However, in contrast to measures of general conspiracist ideation which have tended to refer to many unrelated theories, measures with more complex structures have focused narrowly on conspiracy theories concerning a single event or situation. For instance, some (though not all: see Crocker et al., 1999) measures focusing on theories alleging a conspiracy against African Americans have been reported to have a two-factor structure (Parsons et al., 1999; Simmons & Parsons, 2005). Parsons et al. (1999) label one factor 'benign neglect' theories and the other 'malicious intent' theories. While the researchers do not report the correlation between the two subscales, scores were largely predicted by the same variables, suggesting similar psychological foundations. Likewise, Swami et al. (2010) found an analogous two-factor structure for a measure of belief in various conspiracy theories concerning the 9/11 attacks. One factor encompassed relatively passive theories proposing that the government is merely covering up certain information about the events, while the second factor reflected more active theories alleging that the government was directly involved in planning and perpetrating the events. Despite the distinction between the two factors, factor scores correlated strongly and positively. Thus even when distinct factors have emerged, it appears that belief in

one type of conspiracy theory about an event is associated with belief in other types, and different categories of beliefs are predicted by largely similar variables.

Another approach towards assessing the relationships between conspiracy beliefs has involved simple bivariate correlations or multiple regression analyses examining the relationships between various specific conspiracy theories. In addition to assessing general conspiracist ideation, Swami et al. (2010) administered a measure specifically of belief in conspiracy theories regarding the 9/11 attacks. Multiple regression analysis found that the strongest predictor of 9/11 conspiracist ideation was belief in other, unrelated conspiracy theories. Similarly, Swami et al. (2011) found that conspiracist beliefs about the July 7th, 2005, terrorist attacks in London were best predicted by general conspiracist ideation. Likewise, beliefs specifically in moon landing conspiracy theories (Lewandowsky, Oberauer, et al., 2013; Swami et al., 2013), conspiratorial explanations for the disappearance of Amelia Earhart (Swami & Furnham, 2012), the abduction of an Austrian child (Stieger et al., 2013), and rejection of climate change as a scientific hoax (Lewandowsky, Oberauer, et al., 2013) have all been demonstrated to correlate positively with beliefs in other, unrelated conspiracy theories. Moreover, Swami et al. (2011, Study 2) assessed belief in a number of entirely fictitious conspiracy theories made up by the researchers for the purposes of the study. Again, the strongest predictor of endorsement of these fictional theories perceived as real was general conspiracist ideation.

While the majority of such research has been correlational, Jolley and Douglas (2013) provide experimental evidence that beliefs about one conspiracy theory can affect endorsement of unrelated theories. The authors manipulated participants' perceptions of the evidence relating to specific conspiracy theories concerning the death of Princess Diana. One group of participants was given information critical of the conspiracy theories, while another group was given information supportive of the theories. Those who read evidence supportive of the theories later endorsed other unrelated conspiracy theories more strongly than did those who read disconfirming evidence. Other research suggests that this influence of conspiracy theories is surreptitious; when an individual's attitudes have been influenced by conspiracist information, the individual is likely to remain unaware that their own opinions have been influenced at all (Douglas & Sutton, 2008).

Perhaps the strongest evidence that an individual who accepts one conspiracy theory is likely to endorse others comes from data indicating that beliefs in mutually incompatible conspiracy theories of the same event are positively correlated. Wood et al. (2012) demonstrated this by assessing belief in several conspiracy theories concerning the death of Princess Diana. Crucially, some of the theories contradict one another. For instance, one theory alleges that Princess Diana faked her own death, while another proposes that her death was arranged by the British secret service. Analyses showed that individuals who endorsed the former theory were more likely to endorse the latter, despite the fact that these explanations obviously cannot both be true. A second study, conducted shortly after the US military operation which resulted in the death of Osama Bin Laden, found that people who endorsed a conspiracy theory postulating that Bin Laden was in fact still alive following the raid were more likely to endorse another theory claiming that at the time of the raid Bin Laden was already dead (Wood et al., 2012).

Goertzel (1994) argued that beliefs in conspiracy theories are intercorrelated because the existence of one conspiracy can be taken as evidence for the existence of others, and in this way conspiracist ideation constitutes a monological network of mutually supportive beliefs. However, this can not be true in the case of mutually incompatible theories such as those alleging that Osama Bin Laden is both dead and alive. Wood et al. (2012) argue that correlations between conspiracy theories may be observed not because of any direct logical relationship between individual theories, but rather because each theory is in agreement with higher-order beliefs about the world which promote and sustain even contradictory conspiracist beliefs. Consistent with this, the researchers found that although beliefs in contradictory theories regarding Osama Bin Laden correlated positively, the relationship was fully mediated by endorsement of the more general allegation that the US government is hiding important information about the raid. This suggests that beliefs in the contradictory theories regarding Bin Laden are the product of a single more generic belief proposing simply that the 'official' narrative is not to be trusted. Consistent with this, Wood and Douglas (2013) found that conspiracy theory advocates who posted comments on online news forums tended to argue against the mainstream explanation of events, rather than espousing a particular alternative theory of their own.

Sociodemographic correlates

Few sociodemographic factors have emerged as consistent correlates of conspiracist ideation. Several studies report no significant relationships between belief in conspiracy theories and age, gender, income, occupational category, or level of education (Abalakina-Paap et al., 1999; Crocker et al., 1999; Darwin et al., 2011; Goertzel, 1994; Herek & Capitano, 1994; Jolley & Douglas, 2013; Parsons et al., 1999; Simmons & Parsons, 2005; Swami et al., 2011, 2013), or at best report weak, inconsistent, or indirect relationships (Goertzel, 1994; Stempel et al., 2007; Swami et al., 2010; Swami & Furnham, 2012). These largely negative findings suggest that, contrary to some popular stereotypes, conspiracist beliefs are generally not limited only to males, the young, the poor, or the uneducated; rather, conspiracist beliefs are equally prevalent amongst almost all sectors of society.

One demographic factor which has been found to correlate with conspiracist ideation is ethnicity; members of ethnic minorities appear to be more susceptible to conspiracy theories. Goertzel (1994) examined conspiracist ideation among randomly sampled Caucasians, Hispanics, and African Americans living in New Jersey. For the purposes of analyses, ethnicity was treated as a linear 'minority status' variable. The author argued that, within the US, Caucasians represent the least socially marginalised community and African Americans the most marginalised, with Hispanics somewhere between the two. A moderate correlation was found between minority status and conspiracist ideation, and the group means confirmed that endorsement of conspiracy theories was lowest among Caucasians, highest among African Americans, and intermediate among Hispanics.

Two subsequent studies compared conspiracist ideation between ethnic groups within the US. Abalakina-Paap et al. (1999) found that amongst a sample of students at a US university, Caucasians rated various conspiracy theories least favourably while Hispanics and African Americans tended to be more favourable. In this study differential endorsement between Hispanics and African Americans was negligible. Similarly, Stempel et al. (2007) surveyed beliefs about 9/11 conspiracy theories within a large sample of randomly selected participants from across the United States. The authors found that Hispanics, African Americans, and Asian Americans were generally more favourable towards certain 9/11 conspiracy theories than were Caucasians, though differences between the three minorities were inconsistent.

Thus, while Goertzel's (1994) contention that racial minority status can be conceptualised as a linear variable is problematic and largely unsupported, the finding that conspiracist ideation is generally stronger among members of ethnic minorities appears to be robust. One explanation which has been offered for this finding is based on the 'social marginality' hypothesis: members of socially marginalised and less powerful groups may turn to conspiracy theories in reaction to their disadvantaged position in society (Stempel et al., 2007). Yet increased conspiracist ideation has not reliably been observed within other marginalised groups (such as females, youths, or those with low income). Crocker et al. (1999) found that ethnicity fully mediated the relationship between socioeconomic status and conspiracist ideation, while Simmons and Parsons (2005) observed no difference in endorsement of conspiracy theories between African Americans of differing social status. Rather than being an effect of general social marginalisation, the observed differences appear to be specific to racial or ethnic marginalisation.

One possibility is that the discrimination faced by ethnic minorities promotes alienation and distrust of the authorities and institutions seen as allowing racial discrimination to persist. Greater belief in conspiracy theories may be a secondary effect of this sense of powerlessness and disaffection (this possibility is explored in more general terms later in this review under the heading *Individual differences*). Lending some support to this speculation, Herek and Capitanio (1994) found that African Americans were less trusting of scientists and doctors than Caucasians. Goertzel (1994) found that scores on measures of interpersonal distrust and anomie were generally higher among African Americans and Hispanics than among Caucasians, partially mediating the relationship between conspiracist ideation and minority status. In addition, African Americans who believe they have been the victims of police harassment because of their race, who believe that African Americans have little political influence, or who blame the problems faced by the African American community on institutional racism, are more likely to endorse conspiracy theories than African Americans who do not report these experiences or beliefs (Abalakina-Paap et al., 1999; Crocker et al., 1999; Simmons & Parsons, 2005). A problem with this explanation, as with much of the individual differences literature discussed later, is that the direction of causality remains to be established. It is not clear whether racial or ethnic discrimination results in alienation which in turn leads to susceptibility to conspiracy theories, or whether greater susceptibility to

conspiracy theorising among ethnic minorities for other reasons causes increased alienation, distrust, and system blame.

Another potential (not mutually exclusive) explanation is that elevated conspiracist ideation among ethnic minorities is a result of greater familiarity with certain conspiracy theories due to their personally relevant and evocative content. Highly emotive rumours are more likely to be passed on than less emotive claims (Heath, Bell, & Sternberg, 2001). Given the specific relevance and emotiveness to African Americans of claims of a conspiracy victimising the black population, it is possible that such a claim is more likely to be transmitted within African American communities than within other minorities or Caucasians. Sunstein and Vermeule (2009) suggest that greater familiarity with a conspiracist claim may result in increased unwillingness to dismiss it outright, even if the individual does not explicitly agree with the claim. It has been demonstrated that mere exposure to conspiracist information can increase endorsement of the claims, though individuals may be unaware that their attitudes have been influenced (Butler et al., 1995; Douglas & Sutton, 2008; Jolley & Douglas, 2013; Swami et al., 2013). This ‘conspiracy cascade’ (Sunstein & Vermeule, 2009) effect may account, at least in part, for stronger endorsement (or weaker rejection) among African Americans of conspiracy theories relevant to their ingroup (Crocker et al., 1999; Goertzel, 1994; Herek & Capitano, 1994; Ross, Essien, & Torres, 2006). However, this explanation remains to be directly tested, and cannot account for stronger endorsement among minorities of conspiracy theories unrelated to their own ethnic group (Abalakin-Paap et al., 1999; Goertzel, 1994; Ross et al., 2006; Stempel et al., 2007).

It should be noted that all studies concerning ethnicity to date have been carried out on US samples, and so the findings are of questionable generalisability. Conspiracy theorising amongst African Americans in particular may be a response to the deeply ingrained history of social and institutional discrimination against black people in the US (e.g. Thomas & Quinn, 1993). It is possible that the relationship between ethnicity and conspiracist ideation is different in other countries with different ethnic populations and different histories of institutional discrimination.

Individual differences

A large proportion of the existing literature concerns the relationships between endorsement of conspiracy theories and individual differences in a selection

of personality variables and other beliefs. The findings reveal that certain clusters of related traits reliably correlate with conspiracist ideation, suggesting a number of ‘conspiracy-prone’ personality types. Taking an overview of the research, the pattern of observed correlations suggests three plausible ways in which certain traits may promote and sustain beliefs in conspiracy theories: conspiracist ideation as a response to mild paranoia, conspiracist ideation as a problem-externalising tool, and conspiracist ideation as a result of openness to new and unusual ideas. However, these proposed mechanisms should be regarded as speculative as in most cases the direction of causality remains to be experimentally demonstrated.

Conspiracist ideation as a response to mild paranoia. One cluster of traits to emerge from the available literature revolves around paranoid ideation. Goertzel (1994) assessed individual differences in trust and anomie in addition to conspiracist ideation. Interpersonal trust was measured by asking participants to rate the degree to which they felt they could trust their friends, neighbours, and the police. Anomie, which refers to the pessimistic belief that the world is generally getting worse, was measured by asking participants the degree to which they believed that it is hardly fair to bring a child into the world, for example. Analyses showed that stronger conspiracist ideation was associated with lower levels of interpersonal trust and higher levels of anomie. Subsequent studies have replicated the finding that distrust and anomie are associated with stronger conspiracy beliefs, as well as finding modest correlations with similar variables including high levels of hostility, cynicism, defiance of authority, impulsive nonconformity, and low agreeableness, reflecting inability to get along easily with other people (Abalakina-Paap et al., 1999; Imhoff & Bruder, 2013; Parsons et al., 1999; Swami et al., 2010, 2011, 2013). A handful of studies report mixed findings – relationships with the Big-5 trait agreeableness are not entirely consistent (e.g. Imhoff & Bruder, 2013; Swami et al., 2013, 2010), and Wood and Douglas (2013) found that conspiracist comments posted online exhibited less hostility than anticonspiracist comments. Yet, on the whole, the general pattern of results supports a relationship between conspiracist ideation and a cluster of traits revolving around distrust, cynicism, and disagreeableness.

Darwin et al. (2011) suggest that these apparent relationships may result from subclinical paranoid and schizotypal personality traits. The authors assessed paranoid ideation and schizotypal traits within a university undergraduate sample. These two measures reflect elements of many of the individual difference variables previously

mentioned. Higher scores on both scales were associated with stronger endorsement of conspiracy theories, and confirmatory factor analysis found a best fit model of conspiracist ideation to include both personality measures. The authors argue that extreme forms of these traits lead to maladaptive behaviours and experiences, such as serious persecutory delusions, which can have a detrimental effect on the individual's mental health and social relationships. Milder versions of the same traits, however, may actually prove adaptive; being slightly suspicious of the intentions of others could lead to the avoidance of personal harm if the suspicions turned out to be correct. Thus conspiracy theories may be a byproduct of mild paranoid and schizotypal traits which promote some degree of distrust, hostility, pessimism and magical thinking. People high in these traits are likely to reject 'official' explanations which appear to be handed down by authorities whom the individual distrusts, and conspiracy theories may offer an appealing alternative explanation. Additionally, as conspiracy theories are predicated on the sinister intentions of hidden conspirators they may seem especially attractive and plausible due to congruence with the individual's existing paranoid worldview.

Conspiracy theories as a response to powerlessness. A second cluster of personality variables pertains to the aversive psychological states associated with a sense of powerlessness. This general hypothesis suggests that conspiracy theories may offer an appealing explanatory tool for individuals seeking to rationalise the problems they perceive in life, allowing the individual to externalise blame and restore a sense of understanding, justification, and control.

Some research stemming from this hypothesis concerns authoritarianism; however, the findings are mixed. Authoritarianism is the tendency to attribute blame to outgroups for the problems faced by the ingroup. Conspiracy theories may appeal to individuals high in authoritarianism by allowing them to identify specific individuals or groups who are to blame for their disadvantaged position, thus avoiding the negative psychological impact of self-blame. Consistent with this, studies have reported small correlations between high authoritarianism and stronger endorsement of conspiracy theories (Abalakina-Paap et al., 1999; Grzesiak-Feldman & Irzycka, 2009; Imhoff & Bruder, 2013; Swami & Furnham, 2012). In contrast, however, McHoskey (1995) found that right-wing authoritarianism was associated with the tendency to reject conspiracy theories of the assassination of President John F. Kennedy. The author explains this finding as a result of the tendency of right-wing

authoritarians to conform to the conventions of the established authority. In the case of conspiracy theories relating to President Kennedy, individuals high in right-wing authoritarianism may therefore be more accepting of the official conclusion of the US government that no conspiracy occurred. Thus, the role of authoritarianism in conspiracist ideation is currently unclear. It is possible that authoritarianism may influence the endorsement or rejection of certain conspiracy theories but not others.

More research has examined individual differences in variables related to perceived self-efficacy. Abalakina-Paap et al. (1999) administered a measure of powerlessness assessing participants' beliefs about their capacity to control and change aspects of their life. Regression analysis found higher scores on the measure to predict stronger endorsement of various specific conspiracy theories. The authors also measured locus of control, finding external locus of control to predict acceptance of the existence of conspiracies generally (but not endorsement of specific conspiracy theories). Some studies focusing on African American samples report perceived lack of control over political processes to be the most important variable for explaining the belief that the US government routinely conspires against the African American population (Parsons et al., 1999; Simmons & Parsons, 2005; however, see Crocker et al., 1999). Other variables indicative of low self-efficacy, including lack of self-esteem, dissatisfaction with life, and anxiety, have also been reliably found to correlate with conspiracist ideation (Abalakina-Paap et al., 1999; Grzesiak-Feldman, 2013; Newheiser, Farias, & Tausch, 2011; Swami et al., 2011).

Consistent with this correlational data, several studies provide experimental evidence that lacking control increases susceptibility to conspiracy theories. Whitson and Galinsky (2008) manipulated participants' sense of control by having some participants recall a situation in which they lacked control and others recall a situation in which they possessed control. All participants then completed a task requiring them to reason about the possible existence of a conspiracy in an ambiguous situation. Analyses showed that participants made to feel powerless were more likely to perceive the existence of a conspiracy than participants whose sense of control was not compromised. Likewise, Prooijen and Jostmann (2013) found that experimentally inducing uncertainty influenced participants' reasoning about potential conspiracies. Outside the laboratory, Grzesiak-Feldman (2013) found that students in an anxiety-inducing situation – awaiting an exam – were especially susceptible to conspiracy theorising.

In total, it appears that individuals experiencing aversive psychological states relating to diminished self-efficacy are more receptive to conspiracy theories. One study to look at the consequences of endorsing a conspiracist explanation for an ambiguous event suggests that conspiracy theorising may alleviate the negative psychological consequences of low self-efficacy by restoring the perception of personal control and risk, and externalising blame for the situation (Sullivan, Landau, & Rothschild, 2010). Thus, a function of conspiracy theories may be the potential attribution of negative or uncontrollable events to a mysterious external agency or a specific identifiable outgroup. The available literature largely supports these speculations, though findings concerning trait authoritarianism are inconclusive.

Conspiracy theories and information-seeking strategies. A third cluster of variables concerns individual differences in information-seeking strategies. One relevant hypothesis which has not found support is that conspiracist ideation results from a preference for simple and concrete explanations over complexity and ambiguity. Groh (1987) argued that the conspiracist mindset, in reflexively attributing events to a conspiracy rather than entertaining alternative possibilities, may be a product of this need for simplicity. Abalakina-Paap et al. (1999) examined this hypothesis by assessing individual differences in need for cognition, tolerance of ambiguity, and attributional complexity, predicting negative correlations between these variables and conspiracist ideation. Contrary to expectations, however, all three variables failed to predict conspiracist ideation. Likewise, Leman and Cinnirella (2013) found no difference between conspiracy believers and nonbelievers in terms of individual differences in need for cognitive closure. On reflection, while the conspiracist mindset may in some regards constitute a relatively simplified view of the world, individual conspiracy theories are themselves often nuanced and complex. Believers can exert significant cognitive effort in seeking out evidence in favour of certain theories, and the task of maintaining belief in a conspiracy theory despite the existence of compelling evidence to the contrary may be cognitively demanding.

A hypothesis which has found more support is that individuals who believe conspiracy theories, rather than being intellectually rigid and closed, are in fact more open to new and unusual ideas than nonbelievers. Swami et al. (2010) found that individuals who endorse conspiracy theories of the 9/11 attacks report consuming more information about the theories. This is perhaps unsurprising, but it should be noted that the direction of causality is unclear; information consumption may lead to

belief that 9/11 was a conspiracy, or prior belief may lead to greater information consumption (or both processes may occur reciprocally). The relative intellectual openness of those who believe conspiracy theories does not appear to be limited to conspiracist information; conspiracist ideation has been found to correlate positively with other anomalous beliefs, including the paranormal, superstitions, New Age beliefs, as well as anomalous experiences (Bruder et al., 2013; Darwin et al., 2011; Drinkwater, Dagnall, & Parker, 2012; Newheiser et al., 2011; Stieger et al., 2013; Swami et al., 2011, 2013).

Overall, these findings suggest that appreciation for new and unusual ideas is associated with actively seeking out information about conspiracy theories, and perhaps being particularly receptive to such information. However, the generality of this apparent openness to unusual ideas is currently unclear. Some studies looking at relationships between conspiracist ideation and the Big-5 personality inventory report weak but statistically significant relationships with trait openness (Swami et al., 2010, 2011, 2013). However, other studies have produced mixed findings (Swami & Furnham, 2012), or failed to reproduce the relationship (Bruder et al., 2013; Furnham, 2013; Imhoff & Bruder, 2013). Thus, it is possible that the intercorrelations between conspiracist ideation and various anomalous beliefs reflect domain-general openness, but findings are not conclusive. An alternative possibility is that the relative open-mindedness of conspiracists is limited to certain specific kinds of anomalous claims.

Summary of individual differences. The literature concerning individual difference correlates of conspiracism suggests that individuals relatively high in paranoid ideation, high in openness, and low in self-efficacy, are particularly susceptible to conspiracy theories. This review has proposed speculative causal mechanisms by which these traits could lead to conspiracy theorising, yet it must be made clear that the existing research is largely correlational and thus does not establish the direction of causality. It is speculated, for instance, that paranoid ideation may predispose an individual to endorsement of conspiracy theories. However, an alternative explanation for the relationship is that prior acceptance of conspiracy theories increases feelings of distrust, hostility and alienation. Similarly the causal relationship between conspiracist ideation and openness is as yet unclear. While there is some experimental evidence that lacking control increases conspiracy theorising, this does not rule out the possibility that conspiracy theories, in

postulating a world controlled from behind the scenes by a powerful elite, erode individuals' sense of self-efficacy. A likely possibility is that the relationships are reciprocal, such that an existing paranoid, powerless, or intellectually open disposition drives the acquisition of conspiracist beliefs, creating a worldview which validates and strengthens the prior disposition, which in turn reinforces the conspiracist beliefs, and so on. Other individual difference variables yet to be examined may also contribute to conspiracist ideation.

Cognitive biases and heuristics

The distinction between cognitive and personality variables is not always clear, and interactions between variables from either category are likely (Irwin, 1993); however, while the previous section focused on the role of largely stable and domain-general personality traits, this section is intended to focus on biases and heuristics in information processing which may be associated with belief in conspiracy theories.

Over the last four decades, extensive research has corroborated a two-system model of cognition (see Kahneman, 2003). System 1 reflects intuition; the processes are automatic, fast and approximate, based on heuristics, biases and emotional cues, and are not available to conscious awareness or introspection. In contrast, System 2 reflects reason; the processes are slow, systematic and effortful, based on rules, logic and rational evaluation of evidence. Research demonstrates that many everyday judgements under uncertainty are biased in systematic ways by the unconscious processes of System 1, which System 2 often fails to correct (Gilovich, Griffin, & Kahneman, 2002; Kahneman, Slovic, & Tversky, 1982; Pohl, 2004; Tversky & Kahneman, 1974).

This insight has been applied to the psychology of anomalous beliefs, producing evidence that supernatural beliefs may be at least in part a product of some of the systematic biases of System 1 (for a review, see French & Wilson, 2007). To date, little research has looked at conspiracist beliefs from the perspective of cognitive biases, yet a small handful of studies provide preliminary evidence that conspiracist ideation, like other anomalous beliefs, may be a product, at least in part, of certain biases and heuristics. Many specific biases have been identified, but thus far only four have been examined in relation to conspiracist ideation – proportionality, projection, illusory pattern perception, and the confirmation bias.

Proportionality. A product of the representativeness heuristic – the assumption that “like goes with like” (Gilovich & Savitsky, 2002, p. 617) – the proportionality bias refers specifically to the tendency to attribute an outcome to a cause proportional to the magnitude of the event. Major events are judged to have major causes while minor events are assumed to have minor causes (Kahneman & Tversky, 1972). Many conspiracy theories pertain to events of national or international significance, providing an explanation in terms of an equally significant conspiracy. Thus conspiracy theories may elicit the proportionality bias, imbuing the theories with an intuitive appeal which the ‘official’ explanations lack. To take one example, explaining the death of President John F. Kennedy, an event of considerable magnitude, as the result of a lone, otherwise unremarkable individual violates the principle of proportionality. On the other hand, explaining the assassination as the result of a vast, powerful, insidious conspiracy maintains proportionality between cause and consequence, and may thus appear more plausible.

To date, three studies have specifically examined the potential role of the proportionality bias in the formation or maintenance of conspiracist beliefs. All have used the context of an assassination. First, McCauley and Jacques (1979) tested the proportionality hypothesis experimentally by creating two versions of a newspaper headline reporting the shooting of a fictitious President. One headline read “Man shoots at the President and misses” while the other read “Man shoots at the President and kills him”. Consistent with the proportionality bias hypothesis, the fatal assassination (and thus more momentous event) was judged more likely to be the result of conspiracy while the nonfatal assassination attempt was judged more likely the result of a lone assassin. However, follow-up studies suggested that participants expected a conspiracy to be generally more likely to succeed in killing a President than a lone assassin. The authors suggested that, rather than being influenced by an automatic, unconscious proportionality heuristic, perhaps participants inferred conspiracy as the most likely cause of a successful assassination using a rational calculation based on the prior expected efficacy of a conspiracy as compared to a lone gunman.

Following from this, Leman and Cinnirella (2007) attempted to rule out any effect of prior expected efficacy by breaking the causal link between the efficacy of the assassin and the outcome. Four vignettes were created. Two were similar to the

headlines used by McCauley and Jacques (1979): in the first scenario a President had been shot and killed, while in the second scenario a shot had missed the President. The two additional vignettes consisted of one which claimed that the president had been shot at and hit but survived, and one which claimed that a shot was fired at the president and missed, yet the President subsequently died of an unrelated cause. The former thus provides an outcome of minor consequence (the president survived) which was unrelated to the efficacy of the shooter (as the shot hit the president), while the latter provides an event of major consequence (the president died) which again was unrelated to the efficacy of the shooter (as the shot missed the President). Conspiracy was deemed the most likely explanation for both scenarios in which the president died, despite the fact that in one of these scenarios the shooter's bullet missed the President. Conversely the shooter was judged less likely to be part of a conspiracy for both scenarios in which the President lived, even though this included a scenario in which the gunman succeeded in shooting the President. This would appear to confirm that an unconscious proportionality bias, rather than a rational calculation, was driving the inference of conspiracy; the attribution of conspiracy depended more on the magnitude of the observed outcome rather than the skill of the shooter. Yet expected efficacy may not have been ruled out completely. Perhaps participants reasoned that a gunman who can succeed in wounding but not killing their target is less effective than one who fatally shoots their target and thus less likely to have been part of a conspiracy.

LeBoeuf and Norton (2012) created vignettes in which the consequences of an assassination were even more far removed from the efficacy of the shooter. Again, vignettes reported the assassination of the President of a small (unidentified) country. However, extending upon the vignettes used in earlier research (Leman & Cinnirella, 2007; McCauley & Jacques, 1979), participants were informed that a British newspaper had subsequently criticised the assassinated leader, and that the criticism had incited attacks against Britain. In a large-magnitude condition, participants were told that the attacks had led to the British Prime Minister declaring war. In a small-consequence condition, participants were told that the British Prime Minister responded peacefully, subduing the attacks. Thus, the assassination itself was not the consequence; rather the magnitude of the consequences – whether Britain became embroiled in a war – was arbitrarily determined by the British Prime Minister's reaction. Participants were tasked with deciding whether the initial assassination was

more likely the result of a lone gunman, or of a conspiracy within the government of the assassinated leader's country. Despite the absence of a direct causal link between the assassination and the ultimate consequences, participants preferred the conspiratorial explanation when the magnitude of the consequences was large.

LeBoeuf and Norton (2012) subsequently demonstrated the same effect using stimuli modelled after the real-world assassination of President John F. Kennedy. Some participants were led to believe that the assassination prolonged the Vietnam War, resulting in 40,000 extra American deaths. Other participants were told that the assassination had no effect on America's involvement in Vietnam. Participants were slightly more likely to endorse a conspiracy theory of the assassination when the consequences were presented as large. Although the effect in this case was smaller than with the fictitious stimuli, the fact that a difference was observed at all for a scenario involving President Kennedy, where it is possible that participants have firm prior beliefs about the subject, would appear to attest to the robustness of the proportionality bias.

Projection. One study suggests that conspiracist ideation may be a product of the sociocognitive tool of projection (Douglas & Sutton, 2011). The projection bias simplifies the complex task of reasoning about the social environment by attributing one's own tendencies on to others. This bias leads individuals to believe that others will generally think, feel, and behave in the same way as they themselves do (Ames, 2004). Douglas and Sutton (2011) note that conspiracy theories arise when conflicting or incomplete information prevents an individual from arriving at a clear and satisfying explanation of an event. Uncertain situations such as these are likely to elicit the projection bias: rather than relying on objective facts, an individual may attempt to infer the mental state and intentions of the alleged conspirators. In this case, an individual's personal willingness to have conspired may affect their judgement of whether the alleged conspirators did in fact conspire. If an individual supposes that they would have been willing to conspire to fake the moon landing, for instance, the process of projection may lead the individual to believe that most other people would be equally willing to have participated in such a conspiracy. And if most other people would, then by implication it is more likely that those accused did in fact go through with it. In this way the projection bias may make conspiracy theories seem especially plausible to individuals with a personal morality which permits engaging in conspiracy.

To test this hypothesis, Douglas and Sutton (2011) first conducted a correlational study which examined beliefs in a number of conspiracy theories, and participants' perceptions that, if in the same position themselves, they would have personally participated in the alleged conspiracies. Machiavellianism, an indicator of moral tendencies, was also assessed. Analysis found that, as expected, greater personal willingness to conspire predicted stronger conspiracist ideation. In addition, the relationship between Machiavellianism and belief in conspiracies was fully mediated by personal willingness to conspire, suggesting that moral qualities are related to conspiracist ideation only in as much as those qualities influence personal willingness to conspire.

A second study aimed to establish causality by experimentally manipulating participants' perceptions of their own moral tendencies. An experimental group was primed with positive moral qualities by recalling an event in which they had helped another person. A control group was not exposed to any moral prime. All participants subsequently rated their belief in various conspiracies and their personal willingness to conspire. The manipulation proved successful; participants primed with positive moral qualities perceived themselves as less likely to conspire than the control group. As predicted, the experimental group also displayed weaker endorsement of conspiracy theories than the control group, and this relationship was fully mediated by personal willingness to conspire. Thus, it appears that perceiving oneself to be moral does not directly affect reasoning about conspiracy theories. Rather, personal morality influences the perception of oneself as willing to conspire, and it is projection of that quality on to others which accounts for the relationship between morality and conspiracist ideation.

Illusory pattern perception. Elsewhere in this review the relationship between individual differences in self-efficacy and conspiracist ideation was described. It was suggested that lacking a sense of personal control, either temporarily or as a stable disposition, may increase conspiracy theorising as a strategy to restore order and control over the environment. One study suggests that the cognitive mechanism underlying this process is illusory pattern perception. The cognitive system is adept at detecting meaningful patterns in complex and chaotic stimuli; without this ability essential tasks such as perceiving threats in the environment or identifying familiar faces would not be possible. However, because the costs of failing to perceive a genuine pattern often exceed the costs of identifying

an illusory pattern, occasionally seemingly meaningful relationships are detected where objectively none exist (see Haselton & Nettle, 2006). Whitson and Galinsky (2008) demonstrated that the tendency to perceive illusory patterns across a number of modalities increases under conditions of low self-efficacy. Following a manipulation designed to decrease participants' sense of control, participants were more likely to perceive visual images in purely random visual noise, to perceive illusory correlations in the financial market, and were more likely to make superstitious causal attributions for events. Crucially, the manipulation also increased the tendency to attribute ambiguous events to conspiracy.

Whitson and Galinsky (2008) argue that conspiracy theories are just one possible product of a cognitive perceptual bias towards seeking meaning within ambiguous stimuli. Conspiracy theories are often predicated upon the perception of meaningful causal relationships between anomalies within a large, complex, and often ambiguous dataset. To take one illustrative example, it has been claimed that a man who conspicuously opened an umbrella moments before President John F. Kennedy was fatally shot must have been a co-conspirator signalling to the assassin (Posner, 1994). The alternative explanation – that the temporal relationship between umbrella and gunfire was merely a coincidence – does not satisfy the need to perceive order in the environment, and so may be less intuitively appealing. Whitson and Galinsky's (2008) findings also provide a possible explanation as to why conspiracy theories inevitably follow shocking events such as unexpected deaths, terrorist attacks, and natural disasters. Such unpredictable and uncontrollable events are likely to threaten people's sense of control and understanding over their immediate environment, thus increasing the tendency to seek patterns which may provide a satisfying causal explanation. By incorporating a large amount of anomalies and errant data into a coherent explanatory framework (see Keeley, 1999) and thus maximising the perception of meaning, conspiracy theories may be more psychologically satisfying than their nonconspiratorial alternatives.

Confirmation bias. Once beliefs are formed they are rarely subjected to critical evaluation. Rather, a bias exists towards seeking and interpreting information in such a way as to confirm an existing preconception (see Lord, Ross, & Lepper, 1979). This bias has been observed in abstract deductive tasks as well as in reasoning about complex, real-world issues (e.g. Powell, Hughes-Scholes, & Sharman, 2012). There is no reason to suppose that conspiracist beliefs should be immune to the

confirmation bias; yet to date just one study has examined the role of confirmation bias in the context of conspiracy theories.

McHoskey (1995) aimed to investigate whether conspiracy theories of the assassination of President John F. Kennedy elicit the confirmation bias. First, participants were surveyed to ascertain their initial opinions towards the conspiracist and nonconspiracist theories of the assassination. Participants were then presented with summaries of evidence for the conspiracy theory and the Oswald theory of the assassination. Each summary contained nine key arguments or counterarguments. After exposure to this information, participants rated the persuasiveness of each of these arguments, and re-rated their endorsement of the conspiracy theory and Oswald theory. Analysis revealed evidence of biased assimilation: people who began the study believing that a conspiracy took place found arguments supporting this position to be more persuasive than evidence in favour of the lone-gunman theory. On the other hand, participants who were initially sceptical of the conspiracy theory rated arguments consistent with the lone-gunman account as more persuasive. The extent of this biased assimilation was proportional to the extremity of the initial attitude; participants with a weak initial leaning demonstrated modest biased assimilation while those with an extreme initial belief displayed stronger biased assimilation. The end result of exposure to the mixed evidence was attitude polarization – participants endorsed their pre-existing position even more strongly following exposure to the evidence.

These findings appear to confirm the relevance of the confirmation bias to the maintenance of conspiracist beliefs. Rather than subjecting an initial preconception to impartial evaluation, the reasoning process is simplified by attending disproportionately to evidence consistent with the initial attitude. The confirmation bias suggests one reason why particular conspiracy theories can be so enduring over time, even in the face of substantial contradictory evidence. When evidence is mixed, complex, and uncertain, as is often the case with the events which attract popular conspiracy theories, exposure to this ambiguous evidence can nevertheless result in the strengthening of an initial attitude. Thus people on opposite sides of an argument can feel that the same body of evidence supports their own pre-existing belief. It should be noted that this bias does not only help perpetuate belief in conspiracy theories, but also disbelief.

Summary of cognitive biases and heuristics. As with other avenues of research discussed in this review, the small number of studies and lack of replication prevent firm conclusions from being drawn; however, the limited available findings suggest that cognitive biases and heuristics may indeed play a role in the formation and maintenance of conspiratorial beliefs. Aspects of conspiracy theories may elicit proportionality, projection, and pattern seeking biases, making the theories appear more plausible than their nonconspiratorial alternatives, while the confirmation bias may contribute to the maintenance and strengthening of conspiracist beliefs over time. Although research has examined each of these biases in isolation, their effects are likely to be additive. It is also possible that other biases yet to be examined may play a role in the formation and maintenance of conspiracy beliefs.

Summary of the literature

This review outlined existing psychological research into conspiracist ideation, divided into four distinct avenues of research. The main findings to emerge from each of these approaches are summarised as follows.

Looking first at associations between conspiracist beliefs, converging evidence from multiple studies using various experimental designs and statistical analyses suggests that endorsement of one conspiracy theory is associated with endorsement of others. Thus, belief in conspiracy theories can be conceptualised as a stable individual difference variable – conspiracist ideation. Recent research suggests that the correlations between theories arise because conspiracist ideation is a product of a small set of intercorrelated higher-order conspiracist beliefs. These core beliefs promote and sustain belief in a wide range of specific conspiracy theories, thus accounting for the correlations between ostensibly unrelated and even directly contradictory theories.

Second, ethnicity has emerged as the only reliable sociodemographic correlate of conspiracist ideation. Ethnic minorities within the United States have been found to endorse conspiracy theories more strongly than Caucasians, especially theories relevant to their own ethnic demographic. However, the causal relationships between ethnicity, discriminatory experiences, political alienation, and conspiracist ideation, and the generalisability of these findings, are not known.

Third, research examining individual difference correlates of conspiracist ideation suggests that there may be certain ‘conspiracy-prone’ personality types,

including individuals high in paranoid ideation and related traits, individuals low in self-efficacy, and individuals relatively open to unusual (particularly anomalistic) ideas. Individuals possessing these traits may be especially attracted to conspiracy theories; however, the causal mechanisms underlying these correlations remain to be established.

Finally, a handful of studies examining cognitive biases and heuristics in the context of conspiracist ideation suggest that conspiracy theories may elicit a number of biased reasoning strategies. In this way unconscious cognitive processes may serve to make conspiracy theories generally appear more plausible or appealing than their nonconspiracist counterparts.

It is perhaps possible to begin to speculate about a unifying model of conspiracist ideation by integrating findings from each of the different avenues of research. It appears that certain information-processing biases and heuristics can imbue generic assumptions about the prevalence of conspiratorial behaviour in the world with intuitive plausibility, such as the assumption that governments generally do not tell the public the truth about significant events. People in certain psychological states, either due to stable personality traits or temporary situational factors, may be more inclined to entertain these generic conspiracist assumptions. To the extent that these assumptions are applicable to events and observations on hand from the real world, conspiracy theories of events may be adopted as viable explanations. Belief in the paranormal has been conceptualised in similar terms (e.g. French & Stone, 2014; Irwin, 1993); therefore, this speculative model begins to suggest that conspiracist ideation can be situated within the wider context of anomalous beliefs.

Limitations and research objectives

While some specific methodological and theoretical weaknesses have been discussed throughout this review, it is important to consider some general limitations which concern the body of research as a whole. It is these limitations which serve to motivate the research undertaken in the current thesis.

First, the findings to date have been produced using a variety of scales to assess conspiracist ideation. However, relatively little attention has been given to the measurement devices themselves. Each measure is composed of an arbitrary selection of items, each referring to a specific, currently popular conspiracy theory.

Moreover, with only one recent exception (Bruder et al., 2013), the psychometric properties of the various measures have not been extensively examined. It is therefore difficult to be sure that the various scales measure precisely the same psychological construct, and whether the findings from studies using different measures are directly comparable. This leads to the first research objective of the present thesis – to devise and validate a novel measure of conspiracist ideation. Findings concerning the structure of conspiracist beliefs suggest a potentially superior assessment approach. It appears that beliefs in specific conspiracy theories are the product of more generic assumptions – particularly that something is wrong with the ‘official story’ (Wood et al., 2012). If this is the case, a more useful measurement approach may be to assess attitudes towards these kinds of fundamental generic conspiracist assumptions.

Second, the research as a whole has lacked a theoretical framework, taking a largely piecemeal approach towards selecting variables of interest. This is perhaps understandable, given that the body of research is in its infancy. However, some avenues of research would potentially benefit from a more theory-driven approach. The integrative summary presented by the current literature review suggests that a useful theoretical starting point may be the wider literature on anomalistic psychology. Anomalistic beliefs are those which defy conventional understanding of reality, including (but not limited to) superstitions, belief in the paranormal, and certain alternative medical beliefs (see French & Stone, 2014; Holt, Simmonds-Moore, Luke, & French, 2012). Like anomalous beliefs (see French & Wilson, 2007; Irwin, 1993), conspiracist ideation appears to result from the operation of various low-level cognitive biases mediated by a selection of personality variables. The reliable correlations observed between beliefs in conspiracy theories and beliefs in the kinds of paranormal phenomena on which anomalistic psychology has traditionally focused further suggest that both may result from similar psychological factors. To date, however, there has been little explicit consideration of the potential conceptual overlap between conspiracism and anomalous beliefs.

This leads to the second research objective of the current thesis – to systematically investigate the role of certain cognitive biases in conspiracist ideation, taking existing research into anomalous beliefs as a starting point. This research objective is driven by the hypothesis that biases which influence supernatural beliefs may also influence conspiracist beliefs. In particular, the present research will focus

on the *representativeness heuristic*. Judgements by representativeness result in the plausibility of a claim being determined by the extent to which it is consistent with – representative of – an individual’s intuitive assumptions about the world. The representativeness heuristic can result in various distinct biases. Research suggests that one such bias – the proportionality bias – may lend certain supernatural claims intuitive plausibility by offering to explain significant events in terms of significant causality (Lupfer & Layman, 1996). Research suggests that the proportionality bias may influence conspiracist beliefs in a similar way (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007). Other biases resulting from the representativeness heuristic have also been implicated in anomalistic beliefs, including the conjunction fallacy (Rogers et al., 2009) and a bias towards attributions of intentionality (Kelemen & Rosset, 2009). Extending upon this, the present thesis will examine the role of these biases in conspiracist ideation.

Research programme

The following three chapters of this thesis each present multiple empirical studies aiming to achieve the research objectives outlined in the previous section. For each study reported in this thesis, informed consent was obtained from all participants and ethical approval for the research was granted by the Goldsmiths, University of London, Department of Psychology Ethics Committee.

Chapter 2 concerns the development of a novel measure of conspiracist ideation. The chapter begins by discussing the limitations of existing measures of conspiracist ideation and the potential merits of taking a more generic assessment approach. A series of 4 studies then details the creation and validation of a novel measure of individual differences in generic conspiracist ideation. Study 1 documents the item selection process, while three subsequent studies aimed to establish the psychometric validity of the resulting 15-item scale. Study 2 establishes content and criterion-related validity, as well as test-retest reliability. Study 3 concerns convergent validity, while Study 4 turns to discriminant validity. A final general discussion outlines the strengths and limitations of this novel measure, as well as the contribution of this research to theoretical understanding of conspiracy theories.

Chapter 3 concerns judgements by representativeness. The chapter begins with a general introduction to the representativeness heuristic, detailing the role of

representativeness in judgments of causality and in the evaluation of supernatural explanations. It is argued that the representativeness heuristic may play a similar role in conspiracism. The chapter goes on to present two studies examining specific biases which result from the representativeness heuristic which have been demonstrated to play a role in anomalous beliefs, and are thus hypothesised to play a role in conspiracist ideation. First, Study 5a focuses on the proportionality bias. This study sought to extend upon previous findings suggesting that the proportionality bias imbues conspiracy theories for significant events with intuitive plausibility (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007). Second, Study 5b aimed to investigate the role of another product of the representativeness heuristic, the conjunction fallacy. People with greater belief in the paranormal have been found to be more susceptible to the conjunction fallacy (Rogers et al., 2009, 2011). This current study aims to investigate the association between the conjunction fallacy and conspiracist beliefs. These two studies are followed by a general discussion which summarises the implications of these findings.

Chapter 4 goes on to examine whether the representativeness heuristic influences conspiracist ideation in a third way – through biased attributions of intentionality. The chapter begins with an overview of the literature on judgments of intentionality, including the tendency towards overattribution of intentionality. Evidence suggests that certain supernatural claims appear plausible because they are representative of a world in which events are the product of intentional agency (Atran & Norenzayan, 2004; Boyer, 2003; Evans & Wellman, 2006; Kelemen, 2004; Petrican & Burris, 2012; Riekkki, Lindeman, Aleneff, Halme, & Nuortimo, 2013). Extending upon these findings, this chapter presents four studies guided by the hypothesis that conspiracy theories may be evaluated favourably to the extent that an individual is biased towards explaining ambiguous events in the world in terms of intentional agency, as opposed to accident or chance. Study 5c examines this hypothesis in the context of imagined events, while Study 6 concerns the context of perceived events. Study 7 concerns individual differences in anthropomorphic attributions. Finally, Study 8 examines anthropomorphism and inferences of intentionality in conjunction. The studies are followed by a general discussion which seeks to integrate the somewhat mixed findings.

Finally, Chapter 5 presents a summary of key findings and implications, as well as considering limitations of the research and potential directions for future research.

Chapter 2

Measuring Belief in Conspiracy Theories: The Creation of a Generic Conspiracist Beliefs Scale

Introduction

As discussed in the literature review section of Chapter 1 of this thesis, the most robust finding to emerge from the limited existing literature is that individuals who endorse one conspiracy theory tend to endorse others. This includes ostensibly unrelated theories (Bruder et al., 2013; Goertzel, 1994; Stieger et al., 2013; Swami et al., 2010, 2011, 2013), fictitious theories made up by psychological researchers (Leman & Cinnirella, 2007, 2013; McCauley & Jacques, 1979; Swami et al., 2011), and even mutually contradictory theories (Wood et al., 2012). In total, these findings suggest that endorsement of conspiracy theories is not exclusively a result of rational evaluation of the evidence relating to each specific conspiracist claim; if that were the case, positive correlations between unrelated and incompatible theories would not be observed with such regularity. Rather, it appears there are stable individual differences in the general tendency to entertain or dismiss conspiracist explanations for events. This trait has been termed *conspiracist ideation* (Swami et al., 2011).

More research is required to illuminate the psychology of conspiracist ideation, and the number of recent publications on the topic (e.g. Bruder et al., 2013; Darwin et al., 2011; Douglas & Sutton, 2011; Grzesiak-Feldman, 2013; Imhoff & Bruder, 2013; Jolley & Douglas, 2013; Leman & Cinnirella, 2013; Newheiser et al., 2011; Stieger et al., 2013; Swami & Furnham, 2012; Swami et al., 2011, 2013, 2010; Swami, 2012; Wood et al., 2012; Wood & Douglas, 2013) suggests that research is gaining momentum. However, the current body of research is limited by the lack of a validated measure of individual differences in conspiracist ideation. To date, research has relied on rudimentary measures consisting of an arbitrary selection of statements relating to currently popular conspiracy theories. No scale has been subjected to psychometric validation, and no existing scale has been adopted by researchers other than its creators. As a result, several scales attempting to assess individual differences in conspiracist ideation exist; however, it is not possible to state confidently that any existing scale successfully measures the trait it is intended to assess, nor whether findings obtained using one measure would replicate if a

different measure were used. Moreover, the reliance on reference to conspiracy theories currently popular in Great Britain or the US means that existing scales will quickly become obsolete, and are inadequate for sample populations beyond the UK and America.

To produce a coherent body of research it is necessary to devise a valid and psychometrically sound measure which can be used across a variety of empirical contexts. The current chapter will begin by discussing the limitations of earlier approaches towards the measurement of conspiracist beliefs in more depth, before detailing the creation and validation of a novel measure of conspiracist ideation.

Previous approaches towards measuring conspiracist beliefs

Several scales aiming to measure individual differences in general conspiracist ideation have been created to date (Abalakina-Paap et al., 1999; Darwin et al., 2011; Douglas & Sutton, 2011; Goertzel, 1994; Leman & Cinnirella, 2013; Swami et al., 2010). The dominant approach has been to devise a short self-report questionnaire assessing belief in a small number of conspiracy theories concerning real-world events and situations. Measures have consisted of between six and thirty items with each item referring to a specific currently popular claim of conspiracy. Common subjects include the assassination of President John F. Kennedy, the spread of HIV/AIDS, and the Apollo moon landing. Participants rate their endorsement of each item on a Likert-type rating scale ranging from certain disbelief to certain belief. However, there has been little attempt to assess the psychometric properties of any existing measure. Most studies have employed novel measures, with little consideration of the psychometric properties of the measure beyond noting the value of Cronbach's alpha. In the few cases in which a single measure has been used repeatedly (Bogart et al., 2010; Swami et al., 2011; Wood et al., 2012), little attempt was made to investigate the validity or reliability of that measure beyond comparing the value of Cronbach's alpha to the value obtained in previous research. In addition, no measure has yet been adopted by researchers other than the original authors.

This situation presents practical and theoretical problems. Despite the apparent homogeneity of this approach towards measuring conspiracist ideation, each scale represents a unique subset of currently prominent conspiracy theories. For example, climate change conspiracy theories feature in some scales (Douglas &

Sutton, 2011) but not others (Swami et al., 2010). In addition, idiosyncrasies in item content could influence participant responses. Consider two items concerning conspiracy theories alleging the cover-up of extraterrestrials: “Governments are suppressing evidence of the existence of aliens” (Douglas & Sutton, 2011), and “Area 51 in Nevada, U.S., is a secretive military base that contains hidden alien spacecraft and/or alien bodies” (Swami et al., 2010). Although both items implicitly refer to the same theory, the differences in tone and specificity may systematically bias responses. It is possible therefore that existing scales do not produce equivalent or directly comparable measures of conspiracist ideation. Thus, the generalisability of existing findings is questionable.

This practical problem could be resolved if researchers adopted a single standardised measure. However, any such measure would likely be appropriate for only a limited range of geographical and temporal contexts (Bruder et al., 2013; Byford, 2011). Responses may be confounded by the cultural familiarity and relevance (or lack thereof) of the selected theories. For example, conspiracy theories concerning the July 7th, 2005, bombings in London are relatively well known within the UK, but are likely to be less familiar elsewhere. In addition, such a measure would require modification over time as particular conspiracy theories fade from popular awareness and new theories arise in response to world events.

A more fundamental theoretical problem is that existing scales assess attitudes towards a limited number of specific conspiracy theories, yet their intended purpose is to provide a measure of individuals’ generalised tendency towards conspiracy theorising. A successful measure of this overall conspiracist ideation ought to reflect the entire spectrum of conspiracism. However, any measure referring to specific conspiracy theories faces the problem of selecting a small and arbitrary subset of real-world conspiracy theories out of a virtually infinite pool, with the assumption that the selected items are representative of the individual’s overall level of conspiracist ideation. While there is substantial evidence that conspiracist ideation is a unidimensional construct (Goertzel, 1994; Swami et al., 2011; Wood et al., 2012), the content validity of short and potentially unrepresentative measures has thus far gone untested.

Measuring generic conspiracist beliefs

The issues discussed so far raise concerns over the comparability and generalisability of the handful of existing psychological findings, and the theoretical validity and practical utility of any measure which explicitly refers to prominent real-world conspiracy theories. An alternative, and potentially preferable, approach towards measuring conspiracist ideation may be to assess *generic* conspiracist ideation – conspiracist beliefs stripped of the context of any specific event or entity.

Recent theoretical advances suggest that beliefs in specific conspiracy theories are a product of a smaller set of more generic conspiracist beliefs. By analysing comments posted to online news websites, Wood and Douglas (2013) provide evidence that conspiracy theories are predicated upon rejection of mainstream explanations, rather than endorsement of any specific alternative narrative. Moreover, Wood et al. (2012) demonstrated that endorsement of various mutually contradictory conspiracy theories about the death of Osama Bin Laden is predicted by acceptance of the more general claim that the US government is hiding some important information about the Bin Laden raid. Thus, assessing an individual's attitude towards a single generic statement can provide a valid and economical indication of beliefs about numerous specific conspiracy theories.

It would be possible to produce a yet more generic scale item concerning the more abstract idea that governments routinely hide information about the deaths of public figures in order to deceive the public. Endorsement of this abstract claim would presumably provide a valid indication of an individual's beliefs about many popular governmental assassination conspiracy theories, such as those concerning Osama Bin Laden, Princess Diana, and President John F. Kennedy. To take another example, rather than referring explicitly to conspiracy theories of the 9/11 attacks, a nonspecific item would have individuals rate their acceptance of the more generic belief that conspiracy within governments to secretly perpetrate terrorist activities on their own citizens is commonplace. In sum, a scale which samples a representative range of these kinds of generic conspiracist beliefs would assess individuals' beliefs about the typicality of conspiratorial activity in the real world removed from the context of specific historical events.

Taking this generic, non-event-based approach towards measuring conspiracist ideation can potentially overcome the previously mentioned theoretical and practical problems associated with measures referring to specific popular

conspiracy theories. While constructing a measure which refers to specific real-world conspiracy theories necessitates arbitrarily selecting a small subset of conspiracy theories and thus compromising content validity, a generic measure could represent the entire spectrum of conspiracist ideation in an economical way by identifying and reflecting the most important generic beliefs which support beliefs in numerous specific conspiracy theories. While a measure referring to currently popular conspiracy theories will require modification as fashions in popular conspiracy theorising change, a generic measure will remain an appropriate measurement device over time. In addition, by decontextualising conspiracist beliefs, a generic measure can provide a measurement device suitable for any geographical context.

To date, only one attempt at creating and validating such a measure has been presented. The Conspiracy Mentality Questionnaire (CMQ; Bruder et al., 2013) is a 5-item scale which measures endorsement of generic conspiracist statements such as “I think that government agencies closely monitor all citizens.” The authors present initial evidence of the scale’s validity and cross-cultural utility. However, the process of item generation and selection is not documented. As with other existing measures, the 5 items of the CMQ represent an arbitrary subset of conspiracist ideas, assumed (but not demonstrated) to reflect the entire spectrum of conspiracist ideation. To date, no measure of conspiracist ideation has been designed from the bottom up, endeavouring to first identify the most important facets of conspiracism which a successful measure should represent, and to provide a measure which represents these facets. The current research was designed to produce such a measure.

Overview of the present studies

In sum, while several measures of conspiracist ideation have been produced to date, theoretical and practical limitations with these measures call into question their validity and generalisability. The aim of the current research was to produce a psychometrically valid measure of conspiracist ideation by taking a non-event-based assessment approach. The Generic Conspiracist Beliefs (GCB) scale, a novel measure of individual differences in generic conspiracist ideation, was developed across four studies with large and diverse samples. Study 1 details the initial item generation and selection process. Study 2 confirms the construct and criterion-related validity of the 15-item GCB. Studies 3 and 4 provide evidence of the convergent and discriminant validity of the measure.

Study 1: Identifying essential facets of conspiracism

This first study represents the first step towards creating a measure of generic conspiracist ideation, which was to identify the most important aspects of conspiracism which should be represented in the measure. To ensure content validity, a measure should sample from the entire gamut of conspiracist themes; however, a short measure is desirable so as to avoid practical problems associated with lengthy questionnaires such as participant frustration, careless responding, drop out, and reluctance to take part in future studies (see Donnellan, Oswald, Baird, & Lucas, 2006; Schmidt, Le, & Ilies, 2003). To reconcile the conflicting requirements of brevity and completeness, a lengthy measure consisting of 75 generic conspiracist items was administered to an international sample of the general public and subjected to exploratory factor analysis in order to identify the underlying dimensions of conspiracism which a successful measure should represent

Method

Participants and procedure. To recruit a large and diverse sample not composed exclusively of undergraduate psychology students, volunteers were requested via a blog post on psychologytoday.com and a public 'Psychology of the Paranormal' emailing list. In all, 500 participants (225 females, 269 males; no gender data for 6 respondents) completed the questionnaire. Data from eleven participants missing data for more than 1 item were omitted (total valid $N = 489$). Age ranged from 18 to 87 years ($M = 35.9$, $SD = 13.9$). The majority of participants indicated that they were British/Irish (46.6%) or American/Canadian (31.4%). Other nationalities accounted for 18.9% of the sample (3.8% did not provide nationality information). No reward was offered for taking part. Self-selected respondents completed the questionnaire online via a web-based interface.

Measures.

Conspiracist Beliefs Scale (long-form). A novel questionnaire was created, consisting of 75 items intended to reflect generic (i.e. non-event-based) conspiracist beliefs. Items were generated by reviewing the academic (e.g. Abalakina-Paap et al., 1999; Bogart et al., 2010; Crocker et al., 1999; Darwin et al., 2011; Douglas & Sutton, 2011; Goertzel, 1994; Leman & Cinnirella, 2007; Parsons et al., 1999; Swami et al., 2010) and popular (e.g. Dunbar & Reagan, 2006; McConnachie &

Tudge, 2008; Tuckett, 2005; Whalen & Vankin, 2004) literature on conspiracy theories. Some items were adapted from existing measures, while novel items were created based on the ideas promoted by various popular conspiracy theories. Effort was made to cover a diverse and fully representative range of conspiracist claims. Examples include the possibility of terrorist attacks being covertly directed by a country's own government, clandestine use of mind-control technology, secret experimentation and administration of harmful substances on the populace, and concealment by some organisation of evidence of extraterrestrial visitation (see Table 2.1 for exact wording of all positively-worded items). Each item referred to a generic belief such as this which could support belief in various specific real-world conspiracy theories. To produce generic items, nonspecific descriptors such as "certain organisations", "the government", and "significant events" were used in place of references to specific entities or events which are the subject of popular conspiracy theories, such as the US government and the 9/11 attacks. Participants rated items on a 5-point Likert-type scale, with a qualitative label associated with each point (1: definitely not true; 2: probably not true; 3: not sure / cannot decide; 4: probably true; 5: definitely true).

Results

Descriptive data. Average conspiracism scores were approximately normally distributed, with slight positive skew (skewness = .40); the overall mean for the sample ($M = 2.55$; $SD = 0.78$) was slightly below the mid-point of possible values (3.00), indicating modest scepticism towards conspiracy theories on the whole. Males and females did not differ in terms of conspiracist ideation ($t(481) = 0.67$, $p = .50$, $d = 0.06$), nor did the three major nationality groups (British & Irish/North American/Other) represented by the sample ($F(2, 468) = 1.85$, $p = .16$, $\eta^2_p = .01$). There was a small but significant negative correlation between participants' mean conspiracism scores and age ($r = -.125$, $p < .01$); increasing age was associated with decreased endorsement of the generic conspiracist statements.

Factor analysis. Exploratory factor analysis (EFA) using principal-axis factoring was conducted to examine the internal structure of the 75-item measure of conspiracist beliefs. Based on the observed Eigenvalues and visual inspection of the scree plot, a 6-factor solution was initially extracted. All negatively worded items were found to load onto a single factor. As there was no clear conceptual grouping

other than their negative phrasing this was deemed indicative of differential item functioning rather than a true latent dimension (Greenberger, Chen, Dmitrieva, & Farruggia, 2003). Accordingly, all negatively worded items were dropped. EFA was repeated on the remaining pool of 59 items. The significance of Bartlett’s test of sphericity, $\chi^2(1711) = 23820.85, p < .001$, and the size of the Kaiser-Meyer-Olkin measure of sampling adequacy, $KMO = .97$, showed that the 59 items had adequate common variance for factor analysis (Tabachnick & Fidell, 2005).

Examination of initial Eigenvalues and visual inspection of the scree plot prompted investigation of the first unrotated factor as well as a 5-factor solution. Parallel analysis (PA) (O’Connor, 2000) suggested 6 potentially meaningful factors; Eigenvalues for the first 6 EFA factors extracted from the actual data were larger than the corresponding PA Eigenvalues generated from random data, and are thus significant at the level $p < .05$ (see Table 2.1). Thus, retaining 6 or fewer factors for interpretation could be appropriate. However, the Eigenvalue of the 6th factor was only marginally greater than the 95th percentile of the 6th Eigenvalue distribution generated with 500 random datasets of the same size, while Eigenvalues for the first 5 factors were substantially greater than the corresponding PA Eigenvalues. Given that PA has been reported to sometimes overfactor by 1 (Silverstein, 1987; Zwick & Velicer, 1986), as well as the relatively more meaningful pattern of item loadings evident within the 5-factor solution (described below), the more parsimonious 5-factor solution was retained (for completeness, the pattern of item-loadings for the alternative 6-factor solution is given in Appendix 2.1).

Table 2.1. Comparison of results of EFA Eigenvalues with PA Eigenvalues.

Factor	EFA λ	PA λ
1	27.48	0.96
2	3.43	0.88
3	1.33	0.82
4	1.25	0.77
5	1.04	0.73
6	0.73	0.69
7	0.64	0.66

Note. Values obtained using 500 random (uncorrelated) datasets, with 59 variables and $N = 473$ cases (the number of participants with complete item-level data).

The first unrotated factor accounted for 46.64% of the total variance (Eigenvalue (λ) = 27.48), over 7 times more than the second unrotated factor (λ = 3.43, 6.36% of variance accounted for). All items loaded positively with loadings ranging from .43 to .82 (see Table 2.1). Cronbach's α for this factor was .98. Despite the strong first unrotated factor, the forced 5-factor solution was analysed.

The 5-factor solution explained 60.9% of the total variance. Promax oblique rotation was used based on the assumption that the factors should be related to one another. Following rotation, the five factors accounted for approximately equal amounts of variance. Each factor had a minimum of five items loading substantially (.50 or greater) and univocally on to that factor. Three items which failed to achieve a loading of .32 or greater on any factor were dropped. In addition, the few items that cross loaded (achieved a loading of .32 or greater on to more than one factor) were dropped from further analyses (factor pattern matrix loadings, item loadings for the first unrotated factor, Eigenvalues and variance accounted for by each factor are shown in Table 2.1).

The pattern of loadings reflected conceptually meaningful, cohesive, and distinct groupings. Factor one, termed government malfeasance (GM), reflected allegations of routine criminal conspiracy within governments. This factor contained 16 items (α = .93). A second factor, termed extraterrestrial cover-up (ET), contained seven items (α = .94) concerning the deception of the public about the existence of aliens. A third factor, termed malevolent global (MG) conspiracies, consisted of nine items (α = .94) concerning allegations that small, secret groups exert total control over global events. A fourth factor, termed personal well-being (PW), consisted of 16 items (α = .95) relating to conspiracist concerns over personal health and liberty, such as the spread of diseases and the use of mind control technology. The fifth factor, termed control of information (CI), contained eight items (α = .87) relating to unethical control and suppression of information by organisations including the government, the media, scientists, and corporations.

Table 2.2. Conspiracist Beliefs Scale (long-form) items and factor loadings.

	Factor					
	GM	ET	MG	PW	CI	FUF
2. The government has employed people in secret to assassinate others	.80	.08	-.10	-.16	.01	.49
48. Government agencies have been secretly involved in the assassination of their own citizens	.80	-.01	.02	-.11	.04	.61
61. The deaths of certain high-profile public figures have been the result of covert, government-sanctioned operations	.75	.07	.06	.04	-.01	.68
20. Certain world leading political figures who died untimely deaths were in fact “taken out” by government operatives	.72	.07	.02	-.01	-.02	.65
55. Some of the people thought to be responsible for acts of terrorism were actually set up by those responsible	.65	-.04	.10	.21	-.14	.68
19. For strategic reasons, the government permits certain terrorist activities to occur which could otherwise be prevented	.63	-.02	-.05	.33	-.07	.71
69. Some acts of terrorism, which have resulted in the deaths of many civilians, have been secretly directed by government operatives	.61	-.12	.10	.31	-.09	.71
57. High-level politicians have had certain people killed in order to prevent embarrassing events from becoming publicly known	.58	-.03	.01	.15	.05	.66
38. Government agencies secretly keep certain outspoken celebrities and citizens under constant surveillance	.56	.04	.03	-.16	.19	.52
34. The government keeps many important secrets from the public	.53	.08	-.04	-.21	.30	.52
9. Some individuals thought to be responsible for the assassination of public figures were set up by the group responsible	.52	.05	.04	.18	.00	.67
15. The government lies about their knowledge of terrorist activities	.49	-.08	-.14	.09	.36	.61
22. There are ongoing, hidden efforts to marginalise, control or destroy certain groups of people through the use of political policies	.45	-.10	.12	.01	.33	.68
1. Certain celebrities and/or public figures actually faked their own deaths in order to escape the spotlight	.41	.08	-.20	.26	-.03	.43
27. Viruses and/or diseases have been deliberately disseminated to infect certain populations	.37	.02	-.03	.24	.06	.57
4. The government has staged important societal events in order to manipulate voters	.36	-.05	.09	.10	.18	.59
12. The government fakes evidence relating to significant world events to deceive citizens	.31	-.01	.12	.15	.28	.73
30. Evidence of alien contact is being concealed from the public	.02	.91	-.05	-.12	.14	.63
53. Evidence of alien presence on earth is being covered up	.02	.90	-.04	-.03	.07	.66
25. Secret organisations communicate with extra-terrestrials, but keep this fact from the public	.09	.87	-.06	.05	-.05	.64
29. Some UFO sightings and rumours are planned or staged in order to distract the public from real alien contact	.09	.76	-.03	.06	.04	.68
10. Some existing technologies are the result of reverse engineering alien technology	-.02	.73	.02	.09	.02	.63
37. Space missions are deliberately sabotaged so that the public does not learn of existing alien activity in the solar system	.00	.61	.03	.36	-.17	.66
58. Movies and TV shows featuring aliens are a way of preparing the population for the news that aliens are real and have visited earth	-.12	.58	.27	.15	-.05	.64

Table 2.2. Continued.

	Factor					
	GM	ET	MG	PW	CI	FUF
59. The power held by heads of state is second to that of small unknown groups who really control world politics	.08	-.02	.88	-.04	.00	.80
11. A small, secret group of people is actually in control of the world economy	-.11	.04	.87	-.01	.05	.75
70. Certain significant world events have been the result of the activity of a small group who secretly manipulate world politics	.17	-.03	.87	-.08	-.01	.80
42. A small, secret group of people is responsible for making all major world decisions, such as going to war	-.10	-.01	.86	.08	.05	.78
68. Members of a secret group have infiltrated governments and powerful organisations in order to one day bring their group to the point of global control	.04	.03	.76	.04	-.02	.75
64. Many well-known celebrities, politicians and wealthy people are members of a secret society which has control over our lives	-.07	.08	.67	.15	-.03	.70
14. Large, influential industries are in fact tightly controlled by a small, secret group of people	.07	-.02	.66	-.03	.17	.63
44. Small groups of people are in possession of secret knowledge which would change our understanding of the world, and are deliberately keeping it hidden	.09	.17	.38	.05	.28	.80
40. Secret organisations have access to large amounts of personal data on every citizen and sell it to the government	.09	.17	.38	.05	.28	.66
50. The rapid spread of certain viruses and/or diseases is the result of the deliberate, concealed efforts of some organisation	.10	.05	.00	.68	-.02	.73
36. Experiments involving new drugs are carried out on the general public without their knowledge or consent	-.03	.04	.09	.66	.07	.75
18. Cures for certain deadly and common diseases exist, but are being deliberately withheld	-.13	.04	.09	.65	.07	.73
7. Certain natural disasters have in fact been the result of secret testing of powerful and advanced technology with unknown capabilities	.08	.14	-.06	.64	-.07	.65
41. The pharmaceutical industry administers harmful treatments without people's consent in order to keep people sick and boost drug sales	.02	.12	.14	.63	-.07	.73
23. Technology with mind-control capacities exists and is currently being used on people without their knowledge	-.01	.14	.09	.62	.00	.73
24. A lot of information about diseases and treatments is withheld from the public	-.06	-.12	-.07	.61	.48	.75
8. The government withholds a lot of information about diseases and their treatments from the public	-.02	.02	-.06	.56	.32	.72
33. Certain chemicals are put in the water supply in order to control the people	-.13	.18	.26	.54	-.06	.70
46. Experiments involving advanced technologies are carried out on the general public without their knowledge or consent	.08	.07	.11	.53	.05	.74
3. Groups of scientists deliberately attempt to create panic about future risks because it is in their interests to do so	.07	-.03	-.17	.49	.35	.61
62. Advanced technology is secretly used to placate the people and suppress dissent	.06	.05	.22	.49	.06	.78
39. The government deliberately permits certain terrorist activities to occur to keep the public in a state of fear	.41	-.03	.14	.47	-.06	.82
54. Progress towards a cure for cancer, AIDS and other diseases is deliberately being hindered	-.13	.08	.11	.45	.33	.72

Table 2.2. Continued.

	Factor					
	GM	ET	MG	PW	CI	FUF
13. Technology with mind-control capacities is tested on people without their knowledge or consent	.09	.16	.15	.44	.02	.75
51. Some viruses and/or diseases which many people are infected with were created in laboratories as bio-weapons	.11	.09	.05	.43	.14	.70
60. Family planning policies are part of a plot to control and limit certain populations	.05	.02	.14	.28	.23	.62
66. Drugs are deliberately supplied to certain communities in order to marginalise or destroy them	.26	.00	.24	.26	.06	.71
28. New and advanced technology which would harm current industry is being suppressed	.20	.10	.01	-.11	.62	.64
52. New and better technology is suppressed by those whose current business would be disrupted by it	.23	.06	.10	-.19	.62	.66
65. Groups of scientists ensure that only evidence which supports a pre-determined conclusion is made known to the public	-.14	.05	.10	.16	.57	.63
72. Technology is being concealed which is far in advance of what is known to the general public	.05	.13	-.03	.14	.57	.70
21. Government funded scientists manipulate evidence in order to support existing government policy	.15	-.01	-.02	.14	.53	.67
74. The media ensures that only certain information is made known to the public	.18	-.08	.07	.09	.45	.60
71. Certain groups of scientists fabricate data in support of a particular scientific theory out of self-interest	.17	-.09	-.04	.15	.43	.53
17. The government has a large amount of confidential data on every citizen without their knowledge or permission	.08	.00	.18	-.05	.38	.49
Unrotated Eigenvalues	27.48	3.43	1.33	1.25	1.04	
% of variance accounted for following rotation	19.7	15.3	21.6	22.8	18.5	

Note. $N = 473$. Rotated loadings above .32 are shown in bold. GM = government malfeasance, ET = extraterrestrial cover-up, MG = malevolent global conspiracy, PW = personal well-being, CI = control of information, FUF = first unrotated factor.

Factor scores were computed by averaging participants' responses to each item associated with that factor. All five factors were modestly to strongly positively intercorrelated, and all strongly correlated with the overall scale score (see Table 2.2).

Table 2.3. *Correlations between factor scores and overall Conspiracist Beliefs Scale (long-form) score.*

Factor	ET	MG	PW	CI	Overall score
GM	.49	.72	.72	.75	.88
ET		.65	.72	.54	.72
MG			.83	.74	.91
PW				.73	.92
CI					.87

Note. $N = 489$. All correlations significant at the level $p < .001$ (2-tailed). GM = government malfeasance, ET = extraterrestrial cover-up, MG = malevolent global conspiracies, PW = personal well-being, CI = control of information

Discussion

The results of exploratory factor analysis conducted on a large set of generic conspiracist scale items suggests that five important facets of conspiracism must be represented by a successful measure of conspiracist ideation: Government malfeasance conspiracies, malevolent global conspiracies, extraterrestrial conspiracies, personal well-being conspiracies, and control of information conspiracies. Unsurprisingly, given previous evidence for the unidimensional structure of conspiracy beliefs (e.g. Goertzel, 1994; Swami et al., 2011; Wood et al., 2012), as well as the strong first unrotated factor and factor intercorrelations observed here, real-world conspiracy theories frequently merge these different themes. For instance, a conspiracy theory alleging that the US government is secretly colluding with intelligent extraterrestrials to control and harm the human population using advanced technologies merges several of the facets identified here into a single specific theory. The factors identified here are thus not intended to reflect discrete categories of conspiracy theory but rather fundamental underlying assumptions about the world which promote beliefs in many specific conspiracy theories.

Study 2: Factor structure, reliability & criterion validity

Based on the results of Study 1, the 15-item GCB scale was created. The current study aimed to establish content and criterion-related validity, as well as test-retest reliability, using a sample of undergraduate students as is typical of most psychological research. To this end, the factor structure of the scale and its relationships with several existing measures of specific conspiracist ideation were examined.

Method

Participants and procedure. A sample of 235 university undergraduate students was recruited from amongst several UK universities. Participants took part in exchange for entry into a £50 prize draw. Data were collected online via a web-based interface, and participants were asked to complete the questionnaire in a single sitting. Participants were primarily female (77.9%) and British or Irish (75.7%). Age ranged from 18 to 59 years ($M = 24.97$, $SD = 8.76$).

Test-retest data for the GCB scale were solicited from the first 70 participants who completed the questionnaire at Time 1, of which 42 responded and provided complete Time 2 data. Participation in the follow up study at Time 2 was voluntary; no reward was offered. The interval between Time 1 and Time 2 assessments was approximately five weeks. The GCB was the only measure administered at Time 2.

Measures.

Generic Conspiracist Beliefs scale (GCB). A 15-item scale was devised (full item wording and instructions to participants can be found in Appendix 2.1). Three items were generated to represent each factor identified in Study 1. These five factors were intended to guide construction of the measure, ensuring content validity; however, given the observed factor intercorrelations and frequent merging of themes observed in real-world conspiracy theories, in practical usage the final GCB is primarily intended to assess conspiracist ideation as a unidimensional construct. With this in mind, and in the interest of producing the most concise measure possible, it was not deemed necessary to include more than three items per factor. As the long-form measure designed for Study 1 was intended to reveal the important generic assumptions upon which a subsequent measure should be based rather than to provide definitive scale items, the wording of some high-loading items was modified slightly to refer more clearly to the intended generic conspiracist belief, some novel items were generated by merging a number of similar high-loading items into one, and some high-loading items from Study 1 were included unchanged. Participants again rated items on a 5-point Likert-type scale, with a qualitative label associated with each point (1: definitely not true; 2: probably not true; 3: not sure / cannot decide; 4: probably true; 5: definitely true).

Belief in Conspiracy Theories Inventory (BCTI: Swami et al., 2010). The BCTI assesses belief in 14 conspiracy theories regarding specific real-world events

or organisations ($\alpha = .92$; example item “Government agencies in the UK are involved in the distribution of illegal drugs to ethnic minorities”). A mean BCTI score was computed for each participant, excluding those with more than one missing data point (total valid $n = 213$).

Belief in 9/11 conspiracy theories (Swami et al., 2010) was measured using a scale consisting of 17 items, each of which presents a specific conspiracy theory relating to the 9/11 terrorist attacks ($\alpha = .97$; example item, “Individuals within the US government knew of the impending attacks and purposely failed to act on that knowledge”). The responses of participants with more than one missing data point were excluded (total valid $n = 217$).

Belief in 7/7 conspiracy theories (Swami et al., 2011) was measured using a scale consisting of 12 items covering a range of specific conspiracy theories relating to the London bombings of July 7th, 2005 ($\alpha = .95$; example item, “The fact that the UK government is withholding information about the 7/7 bombings is evidence of a cover-up”). The responses of participants with more than one missing data point were excluded (total valid $n = 220$).

Belief in fictitious Red Bull conspiracy theories (Swami et al., 2011) was measured using a scale consisting of 12 items covering a range of novel conspiracy theories regarding the energy drink Red Bull ($\alpha = .90$; e.g., “Red Bull contains illegal substances that raise the desire for the product”). Each of these statements was made up for the purposes of previous research. The responses of participants with more than one missing data point were excluded (total valid $n = 218$).

Demographics. Participants were asked to indicate their age, gender, and nationality.

Results

Descriptive data. A mean GCB score was computed for each participant. On the whole, participants demonstrated modest conspiracist ideation; participants were mildly sceptical but neither strongly agreed nor strongly disagreed that the conspiratorial behaviour described by the GCB occurs routinely, evident from a grand mean score ($M = 2.61$; $SD = 0.87$) approaching the mid-point of the range of possible values (3.00). Means for each item also reflected this trend, with item means ranging from 1.88 ($SD = 1.13$) for the item “Secret organisations communicate with extraterrestrials, but keep this fact from the public” to 3.86 ($SD = 1.21$) for the item

“A lot of important information is deliberately concealed from the public out of self-interest”. No floor or ceiling effects were evident; ratings for each item covered the entire range of possible scores and showed acceptable levels of skew. Overall GCB mean scores showed slight positive skew (.24). Males and females did not differ in terms of conspiracist ideation ($t(233) = 1.63, p = .10, d = 0.21$). A small but significant difference emerged between the nationality groups represented by the sample, with British participants ($M = 2.53; SD = 0.89$) demonstrating slightly more scepticism towards generic conspiracist statements than other nationalities ($M = 2.87; SD = 0.79$); $t(230) = 2.54, p < .05, d = 0.33$. There was a small but marginally significant positive correlation between conspiracist ideation and age ($r(233) = .13, p < .05$); increasing age was associated with stronger endorsement of the generic conspiracist statements.

Internal reliability and factor structure. Reliability and factor analyses were restricted to participants with complete item level GCB data ($n = 225$). Given that the wording of some items was modified from Study 1, the sample was split into 2 in order to permit both EFA and confirmatory factor analysis (CFA) analyses. First, EFA was carried out on data from the first 110 participants. The significance of Bartlett’s test of sphericity, $\chi^2(105) = 1956.81, p < .001$, and the size of the Kaiser-Meyer-Olkin measure of sampling adequacy, $KMO = .93$, showed that the 15 items had adequate common variance for factor analysis (Tabachnick & Fidell, 2005). Examination of initial Eigenvalues and visual inspection of the scree plot suggested a strong first factor, followed by 4 weaker factors. The first unrotated factor accounted for 49.56% of the total variance ($\lambda = 7.43$), over 7 times more than the second unrotated factor ($\lambda = 1.53$, 10.20% of variance accounted for). All items loaded positively on to the first factor, with loadings ranging from .54 to .84. Cronbach’s α for the factor was .93. Despite the strong first unrotated factor, the forced 5-factor solution was analysed. The 5-factor solution explained 64.3% of the total variance. Promax oblique rotation was used based on the assumption that the factors should be related to one another. Following rotation, the five factors accounted for approximately equal amounts of variance. Items largely loaded substantially and univocally on to their intended factor; however, two items failed to load as expected on to the personal wellbeing factor (see Table 2.3).

Table 2.4. *GCB scale items and standardised factor loadings obtained with exploratory factor analysis.*

Scale item	GM	Factor			
		MG	ET	PW	CI
1 The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret	.67				
6 The government permits or perpetrates acts of terrorism on its own soil, disguising its involvement	.81				
11 The government uses people as patsies to hide its involvement in criminal activity	.64				
2 The power held by heads of state is second to that of small unknown groups who really control world politics		.67			
7 A small, secret group of people is responsible for making all major world decisions, such as going to war		.88			
12 Certain significant events have been the result of the activity of a small group who secretly manipulate world events		.73			
3 Secret organisations communicate with extraterrestrials, but keep this fact from the public			.70		
8 Evidence of alien contact is being concealed from the public			.97		
13 Some UFO sightings and rumours are planned or staged in order to distract the public from real alien contact			.79		
4 The spread of certain viruses and/or diseases is the result of the deliberate, concealed efforts of some organisation					
9 Technology with mind control capacities is used on people without their knowledge			.33		
14 Experiments involving new drugs or technologies are routinely carried out on the public without their knowledge or consent				.83	
5 Groups of scientists manipulate, fabricate, or suppress evidence in order to deceive the public					.62
10 New and advanced technology which would harm current industry is being suppressed					.75
15 A lot of important information is deliberately concealed from the public out of self-interest					.80
Unrotated Eigenvalues	0.71	1.07	7.43	0.60	1.53
% variance accounted for following rotation	5.49	5.75	4.80	4.75	4.86

Note. $N = 110$. Loadings below .32 are omitted. GM = government malfeasance, ET = extraterrestrial cover-up, MG = malevolent global conspiracies, PW = personal well-being, CI = control of information

Second, a maximum likelihood CFA using Amos 20.0 was conducted on data from the remaining 115 participants. Given that EFA revealed some ambiguity as to whether the 5-factor solution obtained in Study 1 replicated with the current version of the GCB, CFA was intended to provide a more stringent test of whether the

intended 5-factor structure adequately fits the current data. Given the factor intercorrelations observed in Study 1, a model was specified in which each factor was allowed to correlate with each other factor. Table 2.5 shows factor loadings for each item, and Table 2.6 shows factor intercorrelations. Model fit was evaluated using the following goodness-of-fit indices: the chi-square per degree of freedom (χ^2/df) ratio, the comparative fit index (CFI), the goodness of fit index (GFI), the root mean square error of approximation (RMSEA), and the standardised root mean square residual (RMR). A χ^2/df ratio of less than 3 indicates acceptable fit (Byrne, 2001). Concerning CFI and GFI indices, models with a value of .90 or above can be considered as adequately fitting. A RMSEA value below 0.08 indicates adequate fit. A RMR value of 0.05 or lower indicates close model fit. These rules of thumb are considered overly strict in some circumstances, including small sample size ($N < 250$); in such cases values approximating the above can be considered satisfactory (Marsh, Hau, & Zhonglin, 2004). The results indicated fit bordering on satisfactory. A χ^2 value of 160.02 was obtained ($df = 80, p < .001, \chi^2/df = 1.86$). Other fit indices were: CFI = .78; GFI = .85; RMSEA = 0.09; RMR = 0.07. This 5-factor model was a better fit for the data than a unidimensional model, according to the χ^2 difference test for nested models ($\chi^2 = 197.44, df = 90; \chi^2_{(diff)} = 37.42, df_{(diff)} = 10, p < .001$).

Table 2.5. *Item standardised factor loadings obtained with confirmatory factor analysis.*

Item	Factor				
	GM	MG	ET	PW	CI
1	.45				
6	.60				
11	.79				
2		.70			
7		.67			
12		.74			
3			.40		
8			.73		
13			.68		
4				.02	
9				.03	
14				.02	
5					.50
10					.68
15					.68

Note. $N = 115$. GM = government malfeasance, ET = extraterrestrial cover-up, MG = malevolent global conspiracies, PW = personal well-being, CI = control of information

Table 2.6. *Correlations between latent variables.*

Factor	MG	ET	PW	CI
GM	.37*	.15	.35*	.34*
MG		.16	.31*	.14
ET			.38*	.05
PW				.45*

Note. $N = 225$. * = correlation is significant at the level $p < .001$ (2-tailed). GM = government malfeasance, ET = extraterrestrial cover-up, MG = malevolent global conspiracies, PW = personal well-being, CI = control of information.

Short-term retest reliability. Within the test-retest sample ($N = 42$), mean GCB scores at Time 1 and Time 2 were 2.34 ($SD = 0.82$) and 2.28 ($SD = 0.78$), respectively. A paired samples t -test revealed that overall mean GCB scores did not change significantly over the 5-week interval; $t(40) = 1.14$, $p = .26$, $d = 0.07$. Additionally, the correlation between mean GCB scores at Time 1 and Time 2 was positive and strong ($r(40) = .89$, $p < .001$), indicating good test-retest reliability.

Criterion-related validity. The correlation between GCB and BCTI scores was strong ($r(200) = .82$, $p < .001$). GCB scores correlated strongly with scores on the measure of belief specifically in 9/11 ($r(204) = .75$, $p < .001$) conspiracy theories. In addition, mean GCB scores correlated moderately with endorsement of 7/7 ($r(203) = .67$, $p < .001$) theories, and with fictitious Red Bull theories ($r(207) = .61$, $p < .001$).

To examine the criterion-related validity of the 5 individual GCB facets, a multiple regression analysis was performed with belief in 9/11 conspiracy theories as the criterion variable and the scores on the 5 GCB factors as predictors.

Multicollinearity diagnostics revealed no substantial multicollinearity (Table 2.5).

Table 2.7. *Multicollinearity diagnostics for regression model.*

Predictor	Tolerance	VIF
Government Malfeasance	.41	2.43
Extraterrestrial Cover-up	.37	2.70
Malevolent Global	.57	1.76
Personal Well-being	.39	2.96
Control of Information	.59	1.70

The overall regression model was significant ($F(5, 217) = 38.06, p < .001$, Adj. $R^2 = .47$). Of the 5 factors, Government Malfeasance, reflecting the belief that governments routinely act to harm their own citizens, was the strongest predictor (see Table 2.6 for standardised β values, t -values, and p -values).

Table 2.8. Results of multiple regression analysis with GCB factor scores predicting 9/11 conspiracist beliefs.

Factor	β	t	p
Government Malfeasance	.34	4.29	< .001
Extraterrestrial Cover-up	.20	3.04	< .01
Malevolent Global	.18	2.25	< .05
Personal Well-being	.11	1.24	.22
Control of Information	-.03	-0.44	.66

Discussion

The approximately normal distribution of mean GCB scores centred close to the mid-point of the scale, and the absence of floor/ceiling effects or strong skew, suggests that the GCB has acceptable psychometric properties and successfully captures variation in conspiracist ideation within the undergraduate student population. The pattern of relationships between the GCB and measures of conspiracist ideation assessing belief in certain specific event-based conspiracy theories indicates criterion-related validity; that is, mean GCB scores successfully correlate with scores on other measures of conspiracist ideation assessed concurrently. Most of these relationships were strong. The smallest relationship – with a measure assessing endorsement of an entirely novel conspiracy theory – was still substantial and in the expected direction. In total, these findings indicate that the GCB has acceptable criterion-related validity. The ability to successfully predict a range of specific conspiracist beliefs, including endorsement of a novel theory, suggests that the GCB scale, when employed as a unidimensional measure, possesses content validity. In addition, the strong correlation between participants' initial GCB scores and retest scores after a 5-week interval indicates excellent short-term test-retest reliability.

Looking at the internal factor structure of the scale, individual factor scores differentially predicted endorsement specifically of 9/11 conspiracy theories, with the government malfeasance factor predicting these beliefs most strongly. This

indicates that, to the extent that certain specific event-based conspiracy theories pertain more or less to particular GCB facets, the factor scores may be useful in predicting beliefs in different theories. It must be noted that the results of EFA and CFA cast some doubt on the reliability of the 5 subscales, particularly the personal wellbeing factor; however, these analyses are limited by the small sample sizes used in each. Thus, future research using adequate sample sizes is required to establish the reliability of the internal factor structure of the GCB. However, the primary goal in constructing the GCB was to produce a measure which reflects all important facets of conspiracism, but which can be used as a unidimensional scale. With this in mind, only three items were included per facet, and with such a small number it is perhaps unsurprising that, in practice, the subscales are somewhat unreliable. Given the substantial evidence that overall GCB scores successfully predict an individual's degree of conspiracist ideation, it seems fair to suggest that the GCB can be most productively employed as a single-factorial measure of conspiracist ideation, as intended.

Study 3: Convergent validity and additional evidence of criterion-related validity

Having provided evidence that the GCB possesses content and criterion-related validity, the current study aims to establish convergent validity by examining how well the GCB relates to interpersonal trust, anomie, paranormal beliefs, and delusional ideation – individual difference factors previously found to correlate with belief in conspiracy theories (Darwin et al., 2011; Goertzel, 1994; Swami et al., 2011, 2013) – using a sample of the general public.

Method

Participants and procedure. In an effort to recruit a sample not composed exclusively of undergraduate students, volunteers were requested via a public ‘Psychology of the Paranormal’ emailing list. A total of 208 participants (91 females, 116 males, 1 participant did not provide gender information) completed the survey. Age ranged from 18 to 63 years ($M = 40.5$, $SD = 13.5$). The majority of participants indicated that they were British or Irish (69.2%) or US (10.1%) citizens. Other nationalities made up 19.2% of the sample (1.4% did not provide nationality

information). Self-selected respondents completed the questionnaire online via a web-based interface.

Measures.

Generic Conspiracist Beliefs scale (GCB). The 15-item GCB scale developed for Study 2 was used unchanged. The internal reliability of the GCB scale in the current study was extremely high ($\alpha = .95$).

Belief in Conspiracy Theories Inventory (BCTI: Swami et al., 2010). The BCTI was administered once again to ensure criterion-related validity in an independent sample. As in previous studies, the BCTI demonstrated high internal reliability ($\alpha = .93$). A mean BCTI score was computed for each participant.

Interpersonal trust was measured using a three-item scale ($\alpha = .70$; example item: “You can trust your family”) which has been used in previous research on conspiracist beliefs (Goertzel, 1994). A moderate negative correlation with GCB scores was expected based on previous findings (Goertzel, 1994).

Anomie (the belief that the world is generally getting worse) was measured using a three-item scale ($\alpha = .59$; example item: “It’s not really fair to think about having a child in today’s world”) which has been used in previous research on conspiracist beliefs (Goertzel, 1994). A moderate positive correlation with GCB scores was expected based on previous findings (Goertzel, 1994).

Australian Sheep-Goat Scale (ASGS: Thalbourne & Delin, 1993). Belief in the paranormal was measured using the 18-item ASGS ($\alpha = .96$; example item, “I believe in the existence of ESP”). This measure assesses belief in extrasensory perception, psychokinesis, and life after death. Participants respond to each item on a three-point scale, labelled “True”, “?” (i.e., do not know), and “False”, resulting in a score of 2, 1, or 0 points, respectively. Higher scores reflect stronger belief in the paranormal. A moderate correlation with conspiracy theory beliefs was expected based on previous findings (Darwin et al., 2011; Swami et al., 2011).

Peters Delusions Inventory (PDI-21: Peters, Joseph, Day, & Garety, 2004). The PDI-21 is a psychometrically validated measure of delusional ideation within the general population. Internal reliability in the current study was high ($\alpha = .94$). The PDI assesses magical ideation, paranoia and schizotypal traits, which have previously been linked with belief in conspiracies (Darwin et al., 2011; Swami et al., 2013). In addition, one item explicitly refers to conspiracy (“Do you ever feel there is

a conspiracy against you?”). Thus, a moderate positive correlation with GCB scores was expected.

Demographics. Participants were asked to indicate their age, gender, and nationality.

Results

Descriptive data. Participants generally demonstrated modest scepticism towards conspiracist statements, with the grand mean ($M = 2.22$; $SD = 0.92$) below the mid-point of the range of possible values (3.00). The mean rating for each item also reflected this trend, with average item ratings ranging from 1.61 ($SD = 0.94$) for the item “Secret organisations communicate with extraterrestrials, but keep this fact from the public” to 3.52 ($SD = 1.27$) for the item “A lot of important information is deliberately concealed from the public out of self-interest”. No floor or ceiling effects were evident; ratings for each item covered the entire range of possible scores and showed acceptable levels of skew. Overall GCB scores showed mild but acceptable positive skew (.76). Males and females did not differ in terms of conspiracist ideation ($t(205) = 1.84$, $p = .07$, $d = 0.26$); nor did the three major nationality groups (British & Irish/North American/Other) represented by the sample ($F(2, 202) = 0.71$, $p = .49$; $\eta^2_p = .01$). There was no significant correlation between conspiracist ideation and age ($r(206) = -.09$, $p = .22$).

Criterion-related and convergent validity. The correlation between GCB and BCTI scores was positive and strong ($r(206) = .86$, $p < .001$). Higher GCB scores correlated modestly with delusional ideation, higher anomie, lower interpersonal trust and stronger belief in the paranormal. A similar pattern of correlations emerged between BCTI scores and the personality measures (see 2.6 for all interscale correlations, means and standard deviations).

Table 2.9. Means, standard deviations, and interscale correlations for Study 3.

	GCB (<i>M</i> = 2.22; <i>SD</i> = 0.91)	BCTI (<i>M</i> = 2.58; <i>SD</i> = 1.50)
Trust (<i>M</i> = 5.15; <i>SD</i> = 1.11)	-.34	-.26
Anomie (<i>M</i> = 5.06; <i>SD</i> = 1.29)	.42	.38
ASGS (<i>M</i> = 8.77; <i>SD</i> = 1.50)	.67	.67
PDI (<i>M</i> = 31.37; <i>SD</i> = 31.83)	.48	.45

Note. *N* = 208. All correlations significant at the level $p < .001$

Discussion

The descriptive statistics indicate that the GCB retains acceptable psychometric properties when used with a sample not composed entirely of undergraduate students. Together with the results of Study 2, this indicates that the GCB is an appropriate measurement device both for student and nonstudent samples. On the whole, participants in the current study (self-selected from the general population) indicated similar, though slightly lower, levels of conspiracist ideation than the student sample reported in Study 2. The strong correlation between the GCB and the BCTI indicates that the GCB possesses criterion-related validity when used with a nonstudent sample; that is, higher GCB scores successfully correlate with stronger endorsement of specific conspiracy theories. The observed pattern of correlations between the GCB and measures of interpersonal trust, anomie, paranormal belief, and delusional ideation is consistent with previous findings (Darwin et al., 2011; Goertzel, 1994; Swami et al., 2011, 2013), and indicates that the GCB converges with related measures. In addition, the GCB demonstrated a highly similar pattern of correlations with trust, anomie, delusions, and paranormal belief as did the BCTI, as would be expected of a successful measure of conspiracist ideation. In total, these findings indicate that the GCB possesses criterion-related and convergent validity.

Study 4: Discriminant validity

Having provided satisfactory evidence of convergent validity, this final study aimed to establish discriminant validity by demonstrating the absence of relationships between the GCB and measures of other theoretically unrelated

constructs using a separate sample of the general public. These constructs consisted of sensation seeking, emotional intelligence, and the Big Five factors.

Method

Participants and procedure. To recruit a sample not composed exclusively of undergraduate students, volunteers were requested via online social networks, as well as conspiracy-oriented forums and mailing lists. A sample of 194 participants (88 females, 105 males, 1 participant did not provide gender information) completed the survey. Age ranged from 18 to 81 years ($M = 35.0$, $SD = 14.8$). The majority of participants indicated that they were British or Irish (67%) or US (12.9%) citizens. Other nationalities made up 18% of the sample (2.1% did not provide nationality information). Self-selected respondents completed the questionnaire via a web-based interface.

Measures.

Generic Conspiracist Beliefs (GCB). The 15-item GCB was administered. Internal reliability was again extremely high ($\alpha = .95$).

Big Five inventory (IPIP Big-Five: Goldberg, 1999). The IPIP Big-Five is a 50-item measure of the Big-Five factor markers. Internal reliability for each of the five factors was acceptable in the current study: openness ($\alpha = .75$); conscientiousness ($\alpha = .83$); extraversion ($\alpha = .90$); agreeableness ($\alpha = .82$); neuroticism ($\alpha = .85$). Some previous studies have reported small but significant relationships between belief in conspiracies and higher openness and lower agreeableness, but have found no relationships with the other Big-5 traits (Swami et al., 2010; Swami et al., 2011; Swami et al., 2013). Thus weak correlations between GCB scores and openness and agreeableness were expected. No correlations are anticipated between GCB scores and other Big-5 traits.

Sensation Seeking (SSS-V: Zuckerman, 2007). To demonstrate that the GCB is independent of theoretically independent constructs beyond the Big-5, trait sensation seeking was selected. Of the Big-5 traits, sensation seeking is most strongly related to extraversion (Aluja, García, & García, 2003), which has consistently been found to be unrelated to conspiracist ideation (e.g. Swami et al., 2010; Swami et al., 2011; Swami et al., 2013); thus, no strong relationship between GCB and SSS-V scores was expected. The SSS-V is a 40-item questionnaire ($\alpha = .76$) assessing individual differences in sensory stimulation preferences. Each

question presents participants with two statements and asks that they select the statement which best reflects their own personality, e.g. “I like ‘wild’ uninhibited parties,” or “I prefer quiet parties with good conversation.” Higher scores reflect greater sensation seeking.

Emotional intelligence (TEIQue-SF: Petrides & Furnham, 2006).

Emotional intelligence appears to be related to Big-5 neuroticism, but weakly and unreliably correlates with agreeableness and openness (Petrides et al., 2010). Thus, no strong relationship between GCB and TEIQue-SF scores was expected. The TEIQue-SF is a 30-item measure of trait emotional intelligence ($\alpha = .87$; example item: “Expressing my emotions with words is not a problem for me.”). Higher scores reflect greater emotional intelligence.

Results

Descriptive data. Once again, participants generally demonstrated modest conspiracist ideation, with a grand mean ($M = 2.44$; $SD = 1.00$) slightly below the mid-point of the range of possible values (3.00). No strong skew was evident (.47). Means for individual items reflected a similar trend as observed in Studies 2 and 3, with mean endorsement ratings ranging from 1.74 ($SD = 1.02$) for the item “Secret organisations communicate with extraterrestrials, but keep this fact from the public” to 3.68 ($SD = 1.31$) for the item “A lot of important information is deliberately concealed from the public out of self-interest”. No floor or ceiling effects were evident; ratings for each item covered the entire range of possible scores and showed acceptable levels of skew. Males and females did not differ in terms of conspiracist ideation ($t(191) = 0.20$, $p = .84$, $d = 0.03$); nor did the three major nationality groups (British & Irish/North American/Other) represented by the sample ($F(2, 187) = 1.61$, $p = .20$; $\eta^2_p = .02$). There was no significant correlation between conspiracist ideation and age ($r(190) = -.13$, $p = .07$).

Discriminant validity. Given the sample size of the study, correlations of $r = .20$ will be detected at the level $p < .05$ with 80% confidence. Correlations between GCB scores and each of the Big-5 traits, sensation seeking, and emotional intelligence scores are shown in Table 2.7. No significant correlations were found between conspiracist ideation and sensation seeking, emotional intelligence, neuroticism, extraversion, agreeableness, or openness. A small significant correlation was found between conspiracist ideation and conscientiousness.

Table 2.10. Means, standard deviations, and interscale correlations for Study 4.

	GCB (<i>M</i> = 2.44; <i>SD</i> = 1.00)
Openness (<i>M</i> = 4.03; <i>SD</i> = 0.49)	-.01
Conscientiousness (<i>M</i> = 3.13; <i>SD</i> = 0.70)	-.16*
Extraversion (<i>M</i> = 3.09; <i>SD</i> = 0.83)	-.01
Agreeableness (<i>M</i> = 3.85; <i>SD</i> = 0.62)	.11
Neuroticism (<i>M</i> = 3.06; <i>SD</i> = 0.72)	-.07
SSS-V (<i>M</i> = 20.00; <i>SD</i> = 5.84)	.03
TEIQue-SF (<i>M</i> = 4.92; <i>SD</i> = 0.71)	-.14

Note. * Correlation is significant at the level $p < .05$

Discussion

As in Studies 2 and 3, the GCB demonstrated acceptable psychometric properties, adequately capturing variation in conspiracist ideation in a sample of the general population. In contrast to some previous findings (Swami et al., 2010, 2011, 2013), conspiracist ideation as measured by the GCB was not related to the Big-5 traits agreeableness and openness, while a small but significant correlation emerged between greater conspiracist ideation and lower conscientiousness. While previous research looking at correlations between Big-5 traits and conspiracist ideation has failed to find this relationship, the small correlation may be explained in terms of a failure to conscientiously attend to all the available evidence, including that which conflicts with conspiracist claims. However, among the few studies to report relationships with Big-5 traits, the relationships have been small and not consistently replicated (see Imhoff & Bruder, 2013; Swami et al., 2010, 2013). It seems most reasonable to conclude that relationships with these traits are small and somewhat unstable. Thus, conspiracist ideation cannot be described simply in terms of the Big-5 personality dimensions. As expected, GCB scores were unrelated to the remaining Big-5 traits of extraversion and neuroticism, as well as the related traits of sensation seeking and emotional intelligence. Given the power of the study to detect correlations of $r = .20$ or greater, the pattern of nonsignificant correlations observed

provides evidence for the discriminant validity of the GCB scale; the GCB is either independent of other theoretically unrelated psychological constructs or is at most only weakly associated with them.

General discussion

The aim of this research was to create and validate a novel measure of individual differences in conspiracist ideation. Previously, the dominant approach towards measuring conspiracist beliefs has involved assessing attitudes towards a small number of arbitrarily selected event-based conspiracy theories (e.g. Abalakina-Paap et al., 1999; Darwin et al., 2011; Douglas & Sutton, 2011; Goertzel, 1994; Leman & Cinnirella, 2007, 2013; Swami et al., 2010). Numerous scales have been devised, yet there has been little attempt to validate the various measures or to adopt a single measurement device, and there are concerns over the theoretical validity and practical utility of this general approach. To overcome these problems, this research endeavoured to devise a measure which assesses acceptance of the generic assumptions which support belief in specific conspiracy theories.

Study 1 identified five facets of generic conspiracism through exploratory factor analysis – belief in routine governmental malfeasance; belief in the existence of malevolent global conspiracies; belief in the existence and cover-up of extraterrestrials; concerns over the unethical control of information; and belief in conspiracies infringing on personal well-being and liberty. The existence of these dimensions is not inconsistent with other research which has found conspiracist ideation to be unidimensional (e.g. Bruder et al., 2013; Goertzel, 1994; Swami et al., 2010; Wood et al., 2012). Indeed, in the present research, the five identified dimensions of conspiracism were highly intercorrelated. Based on these findings, it is argued that the five identified facets reflect a small set of intercorrelated conspiracist assumptions which collectively serve to promote and sustain beliefs in individual conspiracy theories, resulting in a coherent network of specific conspiracist beliefs.

Based on the findings of Study 1, the GCB, a short measure sampling from each of the five identified facets of conspiracism, was produced. Studies 2, 3, and 4 provide evidence of the reliability, content, criterion, convergent, and discriminant validity of this novel measure. Study 2 demonstrated that overall GCB scores correlate strongly with scores on a measure of belief in various event-based conspiracy theories (the BCTI; Swami et al., 2010), as well as measures assessing

belief in three specific conspiracy theories (9/11 theories, 7/7 theories, and fictitious Red Bull theories: Swami et al., 2010, 2011). Study 2 also presented evidence that, to the extent that certain conspiracy theories reflect certain facets of conspiracism to a greater or lesser degree, the individual GCB factors may differentially predict endorsement of certain event-based conspiracy theories. However, EFA and CFA found that the intended 5-factor structure was somewhat unreliable, particularly in relation to the personal wellbeing factor. Given the success of the GCB in predicting a range of specific conspiracy beliefs when treated as a unidimensional measure, it seems reasonable to suggest that in practical use the GCB can be considered a unidimensional measure of generalised conspiracist ideation. In sum, these findings indicate criterion-related validity; that is, the generic beliefs assessed by the GCB successfully predict endorsement of various real-world conspiracy theories.

Study 3 provided further evidence of criterion-related validity, finding GCB scores to predict general belief in various event-based conspiracy theories using an independent sample of the general public. In addition, and largely consistent with previous findings, GCB scores correlated with other related measures including low interpersonal trust, anomie, delusional ideation, paranormal belief, as well as conscientiousness (Darwin et al., 2011; Goertzel, 1994; Swami et al., 2011, 2013). Study 4 demonstrated that GCB scores were independent of unrelated psychological constructs including sensation seeking, emotional intelligence, extraversion, and neuroticism. Together, Study 3 and 4 indicate that the GCB possesses convergent and divergent validity.

It should be noted that the self-selection recruitment methods used in the current research may have resulted in unrepresentative samples; however, comparing the findings of the 4 studies does not suggest this to be the case. In Studies 1, 3, and 4, efforts were made to recruit general-population samples diverse in terms of age, nationality, and prior beliefs. Study 2 allowed these samples to be compared with a sample of university students, as is typical of most psychological research. The GCB demonstrated acceptable psychometric properties when used with university students as well as when used with a self-selected sample drawn from the general population. Consistent with previous research, on the whole the current samples indicated modest scepticism towards the existence of conspiracies (e.g. Abalakina-Paap et al., 1999; Goertzel, 1994; Swami et al., 2010; Wood et al., 2012). In addition, the relationships between the GCB and other psychological constructs were largely

consistent with previous findings (Darwin et al., 2011; Goertzel, 1994; Swami et al., 2010, 2011, 2013).

Overall, the current findings show the GCB to be psychometrically at least as useful as any existing measure of conspiracist ideation which refers to specific event-based conspiracy theories (e.g. Douglas & Sutton, 2011; Goertzel, 1994; Swami et al., 2010). Given the strength of the relationships between the GCB and the BCTI (Swami et al., 2010), which refers to specific real-world conspiracy theories, it may be the case that either measure is equally useful when looking at a range of relatively homogeneous, particularly British and American, samples. However, the GCB has important advantages over these measures. By sampling from the entire range of universal and unchanging assumptions from which all specific conspiracy theories arise, the GCB possesses content validity. In addition, by removing the context of particular historical events, the GCB offers a measurement device potentially suitable for more diverse sample populations and which will endure over time despite changing trends in popular conspiracy theorising. These practical benefits make the GCB a potentially preferable measurement device for researchers wishing to assess conspiracist ideation.

Given the extent to which the results of exploratory factors analysis depend on the items which are created as input, it may have been possible to identify different facets of conspiracism by beginning with a different list of generic items. Study 1 aimed to reflect a wide range of the most popular conspiracy theories commonly discussed in the popular and academic literature; thus the 5 identified facets ought to faithfully reflect the spectrum of popular conspiracy theorising, at least in Western cultures. However, different groups or cultures may be preoccupied with different types of conspiracy theories. In light of this, other measures of generic conspiracist ideation may be preferable in some contexts.

Bruder et al. (2013) present an even more generic conspiracist measure than the GCB. The GCB specifies the content and objectives of some conspiracies (e.g. the suppression of new technology) while remaining nonspecific about any entities or events involved in the conspiracies. In contrast, Bruder et al.'s Conspiracy Mentality Questionnaire (CMQ) remains largely nonspecific in regards to both objectives and entities or events. The CMQ was employed cross culturally to successfully predict belief in certain specific conspiracy theories in British, American, German, and Turkish samples. It is possible that the relative brevity and nonspecificity of the

CMQ may have advantages in some contexts. The CMQ may be more suitable for use on certain non-Western cultures, particularly those with nondemocratic political systems (Bruder et al., 2013). However, given that three of the five items of the CMQ allude specifically to the existence of political conspiracies, that scale too may be susceptible to confounding factors such as local system of government and current political events. Indeed, the factor structure of the CMQ was somewhat unstable when employed on a Turkish sample (Bruder et al., 2013). Future research may seek to directly compare the validity of different measures of conspiracist ideation across a variety of different cultures.

In addition to providing a validated measure of conspiracist ideation, the present findings also enhance theoretical understanding of belief in conspiracy theories. Wood et al. (2012) demonstrated that relatively generic beliefs are important antecedents of specific conspiracy beliefs. The current findings extend upon this, identifying five underlying conspiracist beliefs and showing that these generic assumptions about the world strongly predict endorsement of various specific conspiracy theories. This is consistent with the idea that conspiracist ideation is a monological belief system in which beliefs in many individual conspiracy theories are supported by relatively generic convictions such as the belief that governments routinely harm and deceive their citizens (Goertzel, 1994; Wood et al., 2012). Given the intercorrelations between the five conspiracist facets observed here, it is feasible that these convictions are themselves a product of even more abstract ideas, such as an essential distrust of authority. While it may be possible to construct a measure which aims to tap into these abstract sentiments, the most successful measure of conspiracist ideation may be one which achieves an appropriate balance between specificity and abstractness, as the current research aimed to achieve with the GCB.

Summary and conclusions

In sum, the current findings indicate that the GCB is a successful and psychometrically valid measure of individual differences in conspiracist ideation. The GCB has a number of advantages over existing measures, making it a preferable measurement device for use in future research. The psychology of conspiracist beliefs is thus far a relatively under-researched topic, but recently more psychologists are turning their attention to conspiracy theories. It is hoped that the GCB will provide researchers wishing to assess individual differences in conspiracist ideation

with a measurement device which can be used across a wide variety of empirical contexts, resulting in a consolidated and cohesive body of research.

The next two chapters of this thesis describe the first efforts to employ the newly created GCB to investigate psychological factors which may influence the formation or maintenance of conspiracist beliefs. Specifically, the GCB is employed to investigate the relationships between conspiracist ideation and several cognitive biases resulting from the representativeness heuristic.

Chapter 3

Conspiracy Theories and Judgements by Representativeness: The Proportionality Bias and the Conjunction Fallacy

Introduction

The representativeness heuristic

The representativeness heuristic refers to the intuitive assumption that “like goes with like” (Gilovich & Savitsky, 2002, p. 617). More specifically, the heuristic is the reflexive belief that a specific observation, such as an event, outcome, or member of a category, ought to be similar to the population or category prototype, and should reflect relevant features of the processes that produced it (Gilovich & Savitsky, 2002; Kahneman & Tversky, 1972, 1973; Teigen, 2004; Tversky & Kahneman, 1971, 1974). The subjective probability of an outcome or hypothesis is evaluated in terms of how well these representativeness criteria are satisfied: outcomes which conform to these expectations will be judged to be more plausible than those which do not.

This simple rule of thumb is often useful, requiring few cognitive resources but leading to correct (or at least approximately correct) judgements in many contexts (Teigen, 2004). However, outcomes which are deemed subjectively representative are not always objectively the most probable. Because it entails disregarding potentially relevant factors and alternative possibilities, the representativeness heuristic can lead to systematically biased judgements. The diversity of situations in which the heuristic is invoked, the variety of systematic reasoning biases which can result, and its ability to affect the judgements of laypeople and experts alike led Fiske and Taylor to suggest that representativeness is “our most basic cognitive heuristic” (1991, p. 384).

The representativeness heuristic was initially explored in relation to predictions about statistical probability and randomness, wherein the difference between objective probability and subjective judgements can be easily demonstrated. In particular, when predicting the likelihood of a particular sample or the distribution of outcomes within a sample, such as the outcome of a series of coin tosses, the representativeness heuristic entices people to neglect the importance of sample size,

expecting small samples to be as free of bias (and thus as subjectively representative) as much larger samples (Kahneman & Tversky, 1972; Tune, 1964; Tversky & Kahneman, 1971, 1974; Wagenaar, 1972). Even statistically sophisticated mathematical psychologists were found to underestimate the effects of random sampling variation in small samples (Tversky & Kahneman, 1971).

Subsequent research moved beyond predictive scenarios in which objective probabilities can be easily calculated, into the domain of intuitive diagnostic decisions. That is, rather than using knowledge of the population or process to predict the occurrence of a specific outcome, participants are given information about a particular sample, observation, or individual and asked to estimate the likelihood that it belongs to specified categories or populations (Teigen, 2004). In one of the best known examples, Kahneman and Tversky (1973) presented participants with a personality sketch of a hypothetical individual, Jack, designed to resemble a stereotypical engineer. Participants were also given information about the ‘base-rate’ of engineers. Half of the participants were told Jack’s personality sketch had been selected at random from a population of 30 engineers and 70 lawyers, while half were told the reverse – that there were 70 engineers and 30 lawyers. Participants then had to estimate the probability that Jack was one of the engineers from the population of 100. The information concerning the proportion of engineers versus lawyers was almost entirely disregarded; the two different groups of participants differed only marginally in their assessment of the probability of Jack being an engineer, despite the prior probability being considerably different in each case.

This neglect of base-rate information has been demonstrated using a variety of other experimental stimuli (e.g. Bar-Hillel, 1980; Eliades, Mansell, & Blanchette, 2013; Kahneman & Tversky, 1973; Novemsky & Kronzon, 1999; Obrecht & Chesney, 2013; Pennycook & Thompson, 2012; Rusconi, Marelli, Russo, D’Addario, & Cherubini, 2013). When no information on a randomly selected individual’s personality is provided, judgements are generally in line with the base-rate. That is, when people are told that there are 30 engineers in the sample of 100 and given no information about Jack, the chances of him being an engineer are estimated to be 30% (Kahneman & Tversky, 1973). When personality information is available, however, the pertinent base-rate information is often neglected entirely. Instead, judgements are primarily a product of how representative the personality description is perceived to be of the relevant category. In testament to the power of the

representativeness heuristic, people continue to rely upon personality information at the expense of other relevant factors even when explicitly told that the information is of low predictive validity (Kahneman & Tversky, 1973).

In addition to causing failure to take into account base-rate information, the representativeness heuristic leads to nonregressive predictions. Given an exceptionally high-scoring student evaluation, for instance, it may be reasonable to predict that the student will achieve equally exceptional academic success in the future. However, if the evaluation is based on unreliable projective tests, then predictions based on it ought to be regressive – estimates of future academic performance should be less extreme, and closer to the population average. The representativeness heuristic, on the other hand, leads to the assumption that top scorers should continue to excel, and average scorers should remain average (Teigen, 2004). Consistent with this, Kahneman and Tversky (1973) found that participants given a favourable but unreliable evaluation of a student made unduly favourable predictions about the student's future academic performance.

Representativeness and judgements of causality

In addition to affecting predictive and diagnostic judgements, the representativeness heuristic can affect judgements of causality. When determining the cause of a particular outcome, the representativeness heuristic dictates that 'like causes (or is caused by) like' (Teigen, 2004). Specifically, the subjective probability that a particular causal explanation is true is evaluated in terms of the extent to which salient features of the event in question match relevant features of the attributional model. Explanations which offer the expected correspondence will be judged to be more plausible than explanations which result in a mismatch.

There are various potentially salient features which may be used in making these judgements. Some research has focused on physical attributes. Research focusing on children's inferential strategies has found that children assume that, for example, a loud noise was caused by a heavy, as opposed to a light, object (Shultz & Ravinsky, 1977). The representativeness heuristic is not limited to simple physical properties, however. Salient psychological features, such as magnitude, potency, significance, complexity, or emotional valence, can influence attributions. Thus, mundane events are judged to have mundane causes, while exceptional events have exceptional causes; consequences of large magnitude are deemed to have causes of

similarly large magnitude; and negative outcomes are perceived to have negative causes, while positive causes produce positive outcomes (Gavanski & Wells, 1989; LeBoeuf & Norton, 2012; Sim & Morris, 1998).

Taking emotional valence as an example, events which lead to desirable consequences are likely to be attributed to a positive cause. To demonstrate this, LeBoeuf and Norton (2012) created a fictitious scenario in which a husband and wife argued before the husband, Steve, left for work one morning. Steve, wracked by guilt on the way to work, took a detour to buy his wife flowers, and, as a result, arrived late to work. There were two versions of the outcome. In one, Steve's late arrival caused him to miss an important meeting and lose his job. In another, the meeting had been postponed and Steve gave an excellent presentation, earning himself a promotion. Thus, a negative or positive cause (the argument vs. the detour to buy flowers) in turn led to a negative or positive outcome (Steve getting fired vs. promoted). When asked to choose the cause most responsible for Steve getting to work late, participants who were told Steve had been fired tended to choose the argument as the primary cause. On the other hand, participants who were told Steve had been promoted tended to choose the altruistic detour as the primary cause.

Representativeness and anomalous beliefs

So far representativeness has been discussed in terms of relatively mundane predictions and judgements. In addition to this, the representativeness heuristic may play a role in the formation or maintenance of anomalous beliefs. Representativeness may make pseudoscientific or supernatural causal explanations appear intuitively plausible in certain circumstances (Gilovich & Savitsky, 2002; Teigen, 2004).

Lupfer and Layman (1996) examined the conditions under which naturalistic, religious, or nonreligious supernatural attributions, such as fate, are favoured for events. Experimental stimuli were created consisting of vignettes in which salient aspects of the event could be systematically manipulated. The crucial factors were whether the actor had control over events, whether the outcome was positive or negative, and whether the outcome was life altering. Analyses showed that naturalistic explanations were preferred when events were under the actor's control, while religious and other supernatural explanations were preferred for events which were uncontrollable – especially when the outcome had life-altering consequences. In terms of religious explanations, positive outcomes were attributed to God, while

negative outcomes were attributed to Satan. This pattern of results is consistent with the representativeness hypothesis: hypothesised religious and other supernatural causal mechanisms are characteristically beyond our control and comprehension, and so these attributions are representative of events which are similarly uncontrollable.

The representativeness heuristic is not limited to explanations involving God or fate. Many pseudoscientific medical models, for example, are based on the idea that the causes (and/or cures) of physiological and psychological states or illnesses resemble the symptoms of the state or disease. Thus, eating boar is judged to result in aggression and irritability (Nemeroff & Rozin, 1989), and consuming powdered rhino horn is thought to cure impotence (Still, 2003). Astrology may also be driven by representativeness. The core tenet of astrology is that people's personalities are caused by the positions of the stars when they are born, and thus a person's characteristics match features of their astrological sign's namesake. People born under 'Leo', the lion, are said to be proud, forceful leaders, while those born under 'Pisces', represented by fish, are said to be quiet, reserved, and reasonable (Gilovich & Savitsky, 2002). Similarly, graphology, aura reading, and psychoanalysis are all pseudoscientific belief systems which demonstrate a reliance on the principle of 'like causes like'; repressed emotions are said to cause handwriting which slants to the left, depression supposedly results in a dark aura, and preoccupation with sex is thought to cause dreams of snakes or cigars (Gilovich & Savitsky, 2002).

Overview of the current studies

So far this chapter has discussed various effects of the representativeness heuristic, including insensitivity to sample size, neglect of base-rate information, and nonregressive predictions. The role of the heuristic in causal attributions has also been described, including the potential role of representativeness in the formation or maintenance of anomalous beliefs. Two further specific biases which the representativeness heuristic can lead to are the *proportionality bias* and the *conjunction fallacy*. Each has been suggested to contribute towards anomalistic belief formation (Lupfer & Layman, 1996; Rogers et al., 2009, 2011). Extending upon this, the two studies reported in this chapter explore the notion that proportionality and conjunction biases may play a similar role in the formation or maintenance of conspiracist beliefs, by making conspiracist explanations appear particularly representative, and thus plausible, in certain circumstances or for certain individuals.

First, Study 5a extends upon previous research concerning conspiracist ideation and the proportionality bias. Second, Study 5b presents an investigation of the association between the conjunction fallacy and conspiracist ideation.

A sample of 102 first-year psychology undergraduate students participated in all three studies in return for course credit. Data for the three studies were collected concurrently for convenience. The various measures administered were thought to be theoretically distinct, permitting the use of the same sample across the three studies. Volunteers were given a questionnaire booklet containing the questionnaire measures for each of the three studies in a fixed order. The intentional attributions scale (Study 5c) was administered first, as it was thought to be the most susceptible to order effects – specifically, responses may have been biased by responding to conspiratorial questions which may prime intentional attributions. The conjunction measure (Study 5b) was administered second. Two versions were randomly distributed, with the order of items reversed. The proportionality vignette (Study 5a) was administered third, followed lastly by the GCB. This order was determined so that the most explicitly conspiratorial measures were administered last, aiming to avoid prematurely revealing the true purpose of the research. Additionally, to avoid priming ideas of conspiracy theories at the beginning of the study, the word ‘conspiracy’ was not mentioned in the information sheet given to participants prior to filling in the questionnaire. Participants were asked to read all items and instructions carefully, and to respond to all questions as quickly as possible. No time limit was given.

The sample of 102 students was composed of 81 females and 21 males. The majority were of British (63.1%) or other European nationality (26.2%). Participant age ranged from 18 to 44 years ($M = 21.0$, $SD = 5.2$). Males and females did not differ in terms of conspiracist ideation ($t(100) = 0.40$, $p = .69$, $d = 0.08$); nor did the two major nationality groups (British & Irish/Other European) represented by the sample ($t(90) = 0.45$, $p = .66$, $d = 0.09$). There was no significant correlation between conspiracist ideation and age ($r(100) = -.01$, $p = .97$).

Study 5a: Belief in conspiracy theories and the proportionality bias

Introduction

Overview of the proportionality bias. As discussed in the introduction to this chapter, the representativeness heuristic dictates that the plausibility of potential causal attributions will be evaluated in terms of the extent to which relevant features of the explanation correspond to salient features of the event to be explained. The better the perceived match between event and potential explanation, the more likely that explanation is to be endorsed (Gilovich & Savitsky, 2002; LeBoeuf & Norton, 2012; Lupfer & Layman, 1996; Teigen, 2004). There are various potentially salient features which may be used in making these judgements; however, perhaps the most fundamental psychological dimension is *magnitude* – the perceived scale or potency of an event or its consequences (Osgood, 1957). When an event is large, a proportionally large cause is sought; conversely, when consequences are modest, more modest attributions are made. This *proportionality bias* has been demonstrated using a variety of experimental scenarios.

Ebel-Lam, Fabrigar, MacDonald, and Jones (2010) created experimental vignettes describing an outbreak of an infectious disease. One group of participants was told that the disease had killed a substantial number of people (a high-magnitude effect), while a second group was told that the disease had merely hospitalised a smaller number of people (low-magnitude effect). All participants were asked to rate the likelihood of four potential causes. Two were high-magnitude: the outbreak was an act of biological warfare, or the outbreak was the result of an unusually infectious superpathogen. The remaining two potential explanations were low-magnitude: the outbreak was caused by a standard bacterial infection, or was the result of a single employee who became infected with a virus while travelling overseas. Analysis confirmed that participants who had been told that the outbreak had large consequences deemed the high-magnitude causes more probable, while those who were told that the consequences were more mundane rated the relatively mundane causes as more plausible (see also LeBoeuf & Norton, 2012; Spina et al., 2010).

Likewise, extreme causes are preferred for extreme crimes, such as a brutal murder (McClure, Lalljee, & Jaspars, 1991), for devastating natural disasters, such as particularly destructive tornados (Spina et al., 2010), and for extreme accidents, such as a plane crash involving a large number of fatalities (Ebel-Lam et al., 2010).

Proportionally smaller attributions are favoured for lesser crimes, less extreme disasters, or nonfatal accidents.

The effect even extends to a preference for physically large causes for extreme events (LeBoeuf & Norton, 2012; Spina et al., 2010). LeBoeuf and Norton (2012) created a vignette which described the outbreak of an unusual disease among animals at a zoo. In a large-magnitude scenario, participants were told that the disease killed most of the animals at the zoo before being contained. In a small-magnitude scenario, participants were told that the disease was brought under control quickly so that only a few animals died. Two potential causes were offered: a newly obtained small rabbit, or a newly obtained fully grown bear. The bear – the (literally) larger cause – was preferred by participants who had been told that many animals had died, while the rabbit was deemed the more likely culprit when participants believed that few animals had died.

Moreover, evidence suggests that the proportionality bias may influence anomalous beliefs. As mentioned in the general introduction to this chapter, Lupfer and Layman (1996) found that life-changing events (high-magnitude outcomes) are more likely to be attributed to God or Satan (high-magnitude causes) than more mundane events. Other supernatural explanations of relatively lesser magnitude, such as fate or luck, may be offered for certain more mundane events, such as winning a small amount of money in a game of chance; however, consistent with the proportionality hypothesis, the highest-magnitude causes tended to be reserved for the most momentous events.

The proportionality bias and conspiracy theories. Given the influence of the proportionality bias on everyday judgements, as well as its role in the formation of anomalous beliefs, it seems reasonable to suggest that the bias may play a role in endorsement of conspiracy theories. Conspiracy theories generally pertain to events of obvious national or global significance, offering to explain such events in terms of an equally significant conspiracy (see definition section of Chapter 1 of this thesis). Viewed in this light, a conspiracy theory is usually a high-magnitude attribution for a high-magnitude event. Lending further credence to this suggestion, some of the types of events that previous proportionality bias research has focused on, such as outbreaks of disease, natural disasters, extreme crimes, and transportation accidents, are, in fact, the focus of popular conspiracy theories. For example, conspiracy theories claim that HIV/AIDS is a biological weapon, that weather-manipulation

technology was behind Hurricane Katrina, that mass shootings have been staged by the government, and that flight TWA800 was brought down not by a fuel line malfunction, but by the US military. Other conspiracy theories concern events of similar magnitude, such as the deaths of public figures, terrorist acts, and other significant geopolitical events or situations (see McConnachie & Tudge, 2008).

As the literature review section of Chapter 1 described, three studies to date have specifically examined the role of the proportionality bias in reasoning about fictitious Presidential assassinations (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; McCauley & Jacques, 1979). Consistent with the proportionality hypothesis, each study found conspiracist attributions to be more likely when the alleged assassination attempt succeeded or led to a war, as compared to when the assassination failed or had minor consequences. This relationship persisted even when the magnitude of the consequences was explicitly presented as causally unrelated to the actual cause of the event (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007).

In sum, evidence suggests that the proportionality bias may influence anomalous belief formation in general and endorsement of conspiracy theories in particular. However, to date, proportionality research concerning conspiracy theories has involved binary comparisons of assassination scenarios with either small or large consequences. The current study aims to extend upon this by producing an ordinal set of vignettes of increasing magnitude. Specifically, rather than two conditions (high vs. low magnitude), the current study will employ three conditions (low vs. intermediate vs. high magnitude). If the proportionality bias effect holds true, it is hypothesized that the low magnitude event will garner weakest conspiracist attributions, the high magnitude event will invoke the strongest conspiracy theorising, and the intermediate event will invoke attributions between the two.

Method

Participants¹. A sample of 102 first-year psychology undergraduate students (81 females and 21 males) completed the questionnaire in return for course credit.

¹ Data for studies 5a, b, and c were collected in a single session as part of a combined questionnaire package; thus each of the three studies uses the same sample of 102 undergraduate psychology students.

The majority were of British (62.7%) or other European nationality (27.5%).

Participant age ranged from 18 to 44 years ($M = 21.0$, $SD = 5.2$).

Design. Adapting the design used by Leman and Cinnirella (2007), the between-subjects IV in the current study was the magnitude of the consequences of a fictitious terrorist attack. This variable had three levels: low ($n = 35$), intermediate ($n = 34$), and high ($n = 33$). The primary DV was the extent to which participants attributed the event to a conspiracy. In line with Leman and Cinnirella (2007), the study also measured participants' confidence in the accuracy of details contained in the fictitious report, as well as participants' levels of general conspiracist ideation.

Materials.

Generic conspiracist beliefs (GCB). Conspiracist ideation was measured using the novel measure of generic conspiracist ideation described in Chapter 2 of this thesis. Cronbach's alpha for the scale was high (.91).

Proportionality vignettes. Following Leman and Cinnirella (2007), vignettes were created which aimed to manipulate the magnitude of a hypothetical event. The vignettes were presented as a fictitious newspaper report detailing an ostensible terrorist attack. Participants were asked to imagine that the text presented had been transcribed from a real newspaper article, and to use the information in the report to answer the questions which followed (instructions to participants, as well as the vignettes themselves, can be found in Appendix 3.1). The vignettes stated that a bomb had exploded underneath a large office building in a city's financial district, and that a suspect had been detained. Crucially, each vignette also stated how many people had been killed in the blast – this information constituted the magnitude manipulation.

Three versions of the news report were prepared, varying in the magnitude of the consequences of the bombing. The vignettes employed by Leman and Cinnirella (2007) aimed to control for the confounding influence of expected efficacy of a conspiracy versus a lone individual. Similarly, LeBoeuf and Norton (2012) ensured that the consequences were arbitrarily determined, rather than determined by any feature of the event itself. With this in mind, the current study portrayed the consequences of the bombing as arbitrary and incidental, rather than a direct result of the competence with which the bombing was carried out. Specifically, the extent of the loss of life was portrayed as a product of luck, rather than design. One group of participants (low magnitude) read a version which reported that nobody had been

killed in the blast; the report stated that, despite extensive damage to the building, “By pure chance, no lives were lost.” A second group (intermediate magnitude) was informed that 6 people had been killed, and that, “Officials have expressed relief that more people were not harmed in the explosion.” A third group (high magnitude) learned that 600 people had been killed, making the event “the most destructive terrorist act on [redacted] soil.”

Aside from the number of people killed, all other details of the three vignettes were identical. Potential contextual effects (such as the influence of knowledge or memories for events) were minimised by keeping the three vignettes as similar as possible in all regards, with the exception of the magnitude component. To avoid confounding effects of contextual information, other key details of the report, including the name and location of the building, were obscured with black boxes in the style of redacted information.

After reading one of these vignettes, all participants were asked to respond to the same set of statements relating to the described events. Following Leman and Cinnirella (2007), two types of statements were presented. First, four statements related to participants’ perceptions of the factual content of the report; that is, whether participants believe that the facts of the event have been reported accurately (e.g. “The building is not in the financial district” [underlining in original]). Second, four statements related to participants’ inferences about the cause of the event, requiring extrapolation beyond the details reported in the vignette. Specifically, participants were asked to infer whether a lone terrorist was responsible for the attack, or whether a conspiracy had taken place (e.g. “The bomb was planted by someone else (the arrested man was framed)”). Participants were asked to indicate their responses on a Likert-type scale ranging from 1 (“Definitely not true”) to 7 (“Definitely true”).

Half of the items (two factual and two inferential) were negatively worded. After reverse scoring these items, two overall scores were calculated – an average factual score (for which higher scores indicate that participants had greater confidence that the report was factually accurate), and an average conspiracy score (for which higher scores indicate that participants had greater confidence that a conspiracy was responsible for the event).

Procedure. Undergraduate students were approached to take part in research following a lecture on an unrelated topic. Volunteers were given the questionnaire as

part of a larger questionnaire package (see Studies 5b and 5c). To avoid priming ideas of conspiracy theories, the word ‘conspiracy’ was not mentioned in the information sheet given to participants prior to filling in the questionnaire. Three versions of the questionnaire pack, each containing one version of the proportionality vignette, were randomly distributed. The proportionality vignette and related questions were presented before the GCB. Participants were asked to read the proportionality vignette carefully, and to respond to all questions as quickly as possible. No time limit was given.

Results

Data screening. No cases were excluded due to missing data, and no multivariate outliers were identified. In contrast to Leman and Cinnirella (2007), scale reliabilities for the four factual and four inferential questions were low. Cronbach’s alpha for the factual items verged on acceptability ($\alpha = .50$). However, reliability among the four inferential statements was unacceptable ($\alpha = -.12$). Accordingly, the averaged factual and inferential scores were dropped, and all eight factual and inferential items were analysed separately.

Inferential and factual reasoning. A one-way MANOVA was performed to assess the effect of the magnitude of consequences on responses to each of the 8 statements (4 factual and 4 inferential) relating to the reported events. The IV was vignette group (low, intermediate, or high magnitude of consequences). The DVs were mean ratings for each of the 8 statements. Overall, the analysis failed to reach statistical significance (Pillai’s Trace = .11, $F(16, 186) = .67$, $p = .81$, $\eta^2_p = .06$). Individually, none of the 8 analyses emerged as significant; that is, responses did not differ systematically between conditions, either for factual evaluations or inferential judgements. For completeness, mean ratings for each item, and the MANOVA results are displayed in Table 3.1.

Table 3.1. Mean ratings for likelihood of statements being true (standard deviations in parentheses), and MANOVA results.

Item	Vignette group			MANOVA
	Low	Inter- mediate	High	<i>F</i> (2,99)
<u>Factual statements</u>				
The bomb was detonated remotely	4.86 (1.35)	4.82 (1.19)	4.82 (1.29)	0.01 <i>p</i> = .99
The building is <u>not</u> in the financial district*	5.37 (1.57)	5.56 (1.40)	5.70 (1.36)	0.43 <i>p</i> = .65
Someone has been detained	4.86 (1.46)	5.15 (1.48)	4.88 (1.45)	0.42 <i>p</i> = .66
The terrorist is <u>not</u> 35 years old*	4.20 (1.53)	4.79 (1.49)	4.64 (1.39)	1.51 <i>p</i> = .23
<u>Inferential statements</u>				
The terrorist was a madman acting alone*	5.20 (1.08)	4.91 (1.49)	5.30 (1.53)	0.73 <i>p</i> = .48
The bomb was planted by someone else (the arrested man was framed)	3.97 (1.07)	3.82 (1.03)	3.70 (1.10)	0.56 <i>p</i> = .57
The terrorist was acting alone but was perfectly sane*	4.74 (1.27)	4.35 (1.45)	4.52 (1.72)	0.60 <i>p</i> = .55
The terrorist was part of a conspiracy to achieve certain political goals	4.40 (1.31)	4.15 (1.35)	4.64 (1.11)	1.23 <i>p</i> = .29

Note. * item reverse scored.

Conspiracist ideation and novel conspiracist inferences. Mean GCB scores correlated significantly with the two most pertinent conspiracist inference items, “The terrorist was part of a conspiracy...” ($r(100) = .32, p < .01$), and, “The bomb was planted by someone else...” ($r(100) = .21, p < .05$). GCB scores did not correlate significantly with the other two inferential items, nor with any of the factual items.

Given these apparent relationships between general conspiracist ideation and novel inferences of conspiracy, further analyses were carried out examining the effect of vignette group on conspiracist inferences. Specifically, in order to increase statistical power by controlling for the relationship between general conspiracist ideation and novel conspiracist attributions, two ANCOVA analyses were performed with GCB scores entered as a covariate. In each case, the IV was vignette group.

In the first analysis, the DV was mean ratings for the item “The bomb was planted by someone else ...”. ANCOVA requires that there is no effect of the IV on

the covariate, and that there should be homogeneity of regression slopes – that is, the relationship between DV and covariate should not differ by experimental condition (G. A. Miller & Chapman, 2001). Thus, the interaction between vignette group and GCB scores was examined first. The interaction was nonsignificant ($F(2, 96) = 0.62$; $p = .54$, $\eta^2_p = .01$); that is, the relationship between general conspiracist ideation and novel conspiracist attributions was the same at each level of the IV. Moreover, when the covariate was treated as a DV, there were no differences across the 3 experimental groups in this study ($F(2, 99) = 0.11$; $p = .89$, $\eta^2_p < .01$). Thus, ANCOVA is an appropriate analysis with a straightforward interpretation. GCB scores emerged as a significant covariate ($F(1, 98) = 4.80$; $p < .05$, $\eta^2_p = .05$). However, despite adjusting for each participants' level of conspiracist ideation, the effect of vignette group remained nonsignificant ($F(2, 98) = 0.63$; $p = .54$, $\eta^2_p = .01$).

In the second analysis, the DV was mean ratings for the item “The terrorist was part of a conspiracy...”. Again, the interaction between covariate (GCB scores) and IV (vignette group) was nonsignificant ($F(2, 96) = 0.51$; $p = .60$, $\eta^2_p = .01$). GCB scores once again emerged as a significant covariate ($F(1, 98) = 11.86$; $p < .01$, $\eta^2_p = .11$). In this case, the effect of vignette group increased slightly as compared to the previously conducted univariate ANOVA, yet still failed to reach significance ($F(2, 98) = 1.60$; $p = .21$, $\eta^2_p = .03$).

Discussion

The aim of the present research was to examine whether a conspiracist attribution – a high-magnitude cause – is more likely to be offered for an event which is of proportionally high magnitude. Unlike previous studies (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; McCauley & Jacques, 1979), the current data do not provide support for this hypothesis. Three vignettes were prepared describing a fictitious terrorist attack, differing in the magnitude of their consequences; the event was portrayed as either of low, intermediate, or high magnitude in terms of the number of people killed in the blast. Contrary to expectations, the magnitude of the consequences had no effect on the likelihood of participants endorsing a conspiracist explanation of the event.

The current design was largely a conceptual replication and extension of Leman and Cinnirella (2007; see also LeBoeuf & Norton, 2012; McCauley & Jacques, 1979). This previous study presented participants with versions of an

assassination scenario differing in the magnitude of the consequences (specifically, whether or not the president was killed). When the president died, people were more likely to attribute the shooting to a conspiracy. The current study extended on this binary manipulation to comprise an ordinal set of three terrorist attack scenarios, in which the number of civilian casualties was either low (nobody was killed), intermediate (a relatively small number of people were killed), or high (a relatively large number of people were killed). However, this manipulation had no effect on the likelihood of conspiracist attributions.

In addition to failing to replicate the proportionality effect, the current findings differ from those of Leman and Cinnirella (2007) in several important regards. In particular, Leman and Cinnirella found that novel conspiracist attributions for the assassination scenario were unrelated to participants' prior levels of conspiracist ideation. The current study, however, did find a relationship, with higher levels of conspiracist ideation predicting stronger endorsement of two items offering conspiratorial explanations for the novel terrorist attack scenario. Though this is not consistent with Leman and Cinnirella (2007), it appears consistent with other research indicating that endorsement of novel or unrelated conspiracy theories is associated with endorsement of other theories (Goertzel, 1994; Lewandowsky, Oberauer, et al., 2013; Swami et al., 2011; Wood et al., 2012).

To put it another way, Leman and Cinnirella (2007) found that participants' causal inferences were influenced by contextual magnitude information but not by their prior beliefs, while the current study found the reverse – participants' judgements appear to have been guided by their own prior beliefs rather than by contextual magnitude information. It does not appear to be the case that any proportionality effect was merely overshadowed in analyses by the relationship between prior conspiracist ideation and novel conspiracist inferences; ANCOVA analyses controlling for conspiracist ideation suggest that the magnitude manipulation simply did not influence conspiracist inferences.

This suggests one possible reason for the failure to replicate the proportionality effect: it is possible that, in general, novel conspiracist inferences are guided primarily by an individual's general level of conspiracist ideation. When contextual factors are salient enough, however, this relationship is ameliorated, and judgements are guided instead by reasoning biases. It is unclear, however, why the vignettes in the current study did not invoke the proportionality bias, while those

used by other researchers (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; McCauley & Jacques, 1979) did invoke the bias. Perhaps the crucial magnitude component of the vignettes used in the current study was too subtle, or was overshadowed by the mere fact that, according to every vignette, a bomb exploded, damaging a building and putting lives at risk.

Two other differences between the current study and that of Leman and Cinnirella (2007) are worth noting. First, contrary to Leman and Cinnirella (2007), prior conspiracist ideation was not associated with distrust of the veracity of reported facts. In the previous study, people who indicated stronger general conspiracist ideation indicated lesser trust in the ‘facts’ surrounding the fictitious assassination. In contrast, the current study found no correlations between conspiracist ideation scores and endorsement of the factual items relating to the fictitious terrorist attack.

Second, the factual and inferential subscales possessed low internal reliability in the current study. This is in contrast with the data presented by Leman and Cinnirella, in which both subscales possessed acceptable reliability. The specific questions used in the current study were slightly different, but closely modelled on those created by Leman and Cinnirella. It is possible that participants in the current study interpreted the questions differently than those who took part in Leman and Cinnirella’s study. In particular, two of the questions in the inferential subscale are contradictory. One item suggests that a lone “madman” carried out the attack, while another suggests that a lone but “perfectly sane” individual carried out the attack. Although participants were not discouraged from rating competing explanations favourably, the presentation of explicitly contradictory items may have given some participants the impression that they should preferentially endorse only one explanation. If this were the case, it is perhaps unsurprising that covariation among these items would be negative, though it remains unclear why this was the case in the current study but not in Leman and Cinnirella (2007).

It is worth noting that Leman and Cinnirella (2007) found that two items which specifically suggested a conspiracy were influenced by vignette magnitude, while the two items which suggested a lone actor were not individually affected by magnitude. In the current study, the analogous two items suggesting a conspiracy were influenced not by vignette group, but by prior conspiracist ideation. The two items which suggest a lone actor were influence by neither prior conspiracist ideation, nor vignette group. Given this lack of consistency, and the low scale

reliability observed in the current study, future research might seek to refine the way in which conspiracist inferences for novel events are measured, bearing in mind that items disavowing conspiracist explanations are not necessarily directly comparable to items affirming a conspiracy (see also Chapter 2, Study 1 of this thesis).

Future research might also look at what features influence whether (and to what extent) the proportionality bias is evoked. Several studies suggest that the assassination of a President reliably evokes the proportionality bias (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; McCauley & Jacques, 1979). However, given that the current study failed to evoke the bias, it does not appear that merely increasing the absolute number of fatalities resulting from an event is sufficient to increase the effects of the proportionality bias.

Study 5b: Belief in conspiracy theories and susceptibility to the conjunction fallacy

Introduction

The conjunction fallacy is a specific error of probabilistic reasoning whereby people overestimate the likelihood of co-occurring events. The fallacy was first explored in detail by Tversky and Kahneman (1983). Participants were presented with a brief personality sketch describing a hypothetical individual, Linda. The description was constructed to be stereotypically representative of an active feminist, and unrepresentative of a bank teller. Following this description, participants rated the likelihood of a number of statements about Linda, including three key propositions – (a) Linda is an active feminist, (b) Linda is a bank teller, and (c) Linda is a bank teller and an active feminist. Thus, participants judge the likelihood of two singular constituent propositions (one representative and one unrepresentative), as well as a conjunction of the two propositions. Participants who select the conjunctive statement as being more likely than either individual constituent statement have fallen victim to the conjunction fallacy; a conjunction cannot be more probable than one of its constituents, because the former is necessarily a more restrictive set of possibilities than the latter (however, see Gigerenzer, 1991; Wolford, Taylor, & Beck, 1990).

Using several variations of the Linda scenario, Tversky and Kahneman (1983) typically found that between 50 and 90% of participants committed the

conjunction fallacy. These figures have generally been borne out by subsequent research using a wide variety of conjunction scenarios (Agnoli & Krantz, 1989; Epstein, Donovan, & Denes-Raj, 1999; Fiedler, 1988; Fisk & Pidgeon, 1996, 1997, 1998; Moro, 2009; Rogers et al., 2009, 2011; Tversky & Kahneman, 1983; Wolford et al., 1990). The effect appears to be strongest when the conjunction suggests a motive or causal relationship (Nestler, 2008; Tversky & Kahneman, 1983). Conversely, there is some evidence that the fallacy can be ameliorated by giving participants incentives, such as a financial reward, for making sound decisions (Charness, Karni, & Levin, 2010; Tversky & Kahneman, 1983).

Tversky and Kahneman (1983; see also Kahneman & Frederick, 2002) argue that the fallacy is a product of the representativeness heuristic². In the case of the fictitious Linda, the objectively restrictive conjunctive description (Linda is a feminist bank teller) may seem more subjectively representative of the described individual, and thus more intuitively plausible than the singular, unrepresentative (though objectively more inclusive) component description (Linda is a bank teller). This reasoning defies objective laws of probability, but satisfies the representativeness heuristic.

The conjunction fallacy and anomalistic beliefs. To date, three studies have explored the relationship between susceptibility to the conjunction fallacy and belief in the paranormal. In the first (Dagnall, Parker, & Munley, 2007), participants were asked to rate the likelihood of various outcomes of a local football match – (a) Team A score first, (b) Team A score first and win, (c) Team A score first and lose, and (d) Team A score first and the game is drawn. Contrary to expectations, there was no difference in conjunction error rates between paranormal believers and nonbelievers. However, this study has been criticised on the grounds that the sample consisted only of psychology students (who may not be representative of the general population in terms of statistical sophistication), limitations of the measure of paranormal belief employed (the Revised Paranormal Belief Scale: Tobacyk, 1988), and limitations in the measurement of susceptibility to the conjunction fallacy (see Rogers et al., 2009).

Rogers et al. (2009) aimed to overcome these limitations by controlling for participants' training in statistics, using a superior measure of paranormal beliefs (Thalbourne & Delin, 1993), and creating a more sophisticated measure of

² Other potential explanations of the conjunction fallacy have been offered (see Fisk, 2004), but exploration of these hypotheses is beyond the scope of the current research.

susceptibility to the conjunction fallacy. This measure consists of paranormal-themed items (such as an apparently precognitive dream) as well as neutral items (involving, for example, a case of food poisoning). A significant relationship was reported between belief in the paranormal and susceptibility to the conjunction fallacy. Participants who indicated stronger paranormal belief committed more conjunction errors on the paranormal-themed items, and also on neutral items. This finding was replicated by Rogers et al. (2011). These findings suggest that paranormal believers are especially prone to the conjunction fallacy, and that susceptibility to the fallacy is to some extent domain general, affecting all conjunctive judgements regardless of context (paranormal or otherwise).

These findings may reflect a tendency to base judgements on subjective perceptions of the representativeness of certain coincidences rather than on objective probabilistic laws (Rogers et al., 2009). Believers appear to look beyond ‘mere coincidence’, and instead attribute an underlying causal relationship to co-occurring events (Blackmore & Troscianko, 1985; Bressan, 2002; Brugger & Taylor, 2003; Gilovich & Savitsky, 2002). The imagined causal relationship adds to the subjective representativeness of conjunctive events, making them appear more probable than the component events (Nestler, 2008; Rogers et al., 2009; Tversky & Kahneman, 1983). For instance, if a person prone to perceiving separate events as causally related were to have a dream about an old friend and subsequently run into the same person the next day, they may attribute the experience to an underlying paranormal cause. A person less susceptible to this bias may be more likely to attribute the experience to mere coincidence.

The conjunction fallacy and conspiracy theories. It seems reasonable to suggest that the tendency to fall victim to the conjunction fallacy may play a similar role in conspiracist ideation as in paranormal beliefs. A general characteristic of conspiracy theories is the presumption that ostensibly unrelated events are causally related by a conspiracist narrative (Keeley, 1999). Disparate details surrounding an event are woven together and attributed to the machinations of a conspiracy. To take one example, some conspiracy theories surrounding the assassination of President John F. Kennedy point out that video of the event shows a man conspicuously opening an umbrella moments before the gunshots. According to the conspiracy theory, the two events are causally related: the umbrella was a signal to the assassin(s) (Posner, 1994). The tendency to perceive conjunctive events as having an

underlying causal relationship may make conspiracist explanations appear more subjectively representative of events in general and thus more subjectively probable than alternative explanations.

To date, one study, conducted by the present author as part of a Masters research project (Brotherton & French, in press), has investigated the relationship between susceptibility to the conjunction fallacy and belief in conspiracy theories. This study aimed to replicate the finding that paranormal-believers commit more conjunction fallacy errors as compared to nonbelievers, and to extend the design to examine conspiracy-believers as compared to nonbelievers. To assess susceptibility to the conjunction fallacy in various contexts, the research employed an existing measure of susceptibility to the conjunction fallacy consisting of paranormal and neutral-themed items (Rogers et al., 2009). In addition, 8 novel conspiracy-themed conjunction vignettes were created. Conspiracist ideation was measured by way of an existing measure of endorsement of various real-world conspiracy theories (Douglas & Sutton, 2011).

Consistent with previous research, people with stronger belief in the paranormal tended to make more conjunction fallacy errors (Rogers et al., 2009, 2011). Moreover, the same was found to be true of conspiracy-believers; people who indicated stronger endorsement of various popular conspiracy theories committed more conjunction fallacy errors. Also consistent with previous research, this bias was largely unaffected by context. Conspiracy believers made more conjunction errors consistently across all conjunction item types – the effect was not limited to conspiratorial items.

The current study aims to extend on this preliminary work by replicating the relationship between conspiracist beliefs and the conjunction fallacy using the generic measure of conspiracism detailed in Chapter 2 of the present thesis. In addition, while the previous study used a self-selected sample of the general public, the present study employs a sample of university undergraduate students – as is typical of most psychological research – to examine whether the relationship holds true in a non-self-selected sample.

Method

Participants. Studies 5a, 5b, and 5c employed the same sample of 102 first-year psychology undergraduate students. A sample of 102 first-year psychology

undergraduate students (81 females and 21 males) completed the questionnaire in return for course credit. The majority were of British (62.7%) or other European nationality (27.5%). Participant age ranged from 18 to 44 years ($M = 21.0$, $SD = 5.2$).

Design. A correlational design was employed. The variables of interest were conspiracist ideation and susceptibility to the conjunction fallacy in two contexts – neutral and conspiracy. To reproduce the type of analysis used by Rogers et al. (2009), a quasi-IV was formed by performing a median split on the conspiracism variable, dividing the sample into conspiracy believers vs. nonbelievers. For this analysis, the dependent variable was the number of conjunction fallacies made by each participant.

Materials.

Generic conspiracist beliefs (GCB). Conspiracist beliefs were measured using the validated measure of generic conspiracist ideation as described in Chapter 2 of this thesis. Cronbach's alpha for the scale was high (.88).

Modified Scenario Judgements Questionnaire (M-SJQ). A modified version of the SJQ created by Rogers et al. (2009) was employed to assess susceptibility to the conjunction fallacy. The original scale consists of 16 conjunction vignettes. Each vignette describes a situation, followed by three statements pertaining to the situation: two component statements, plus a conjunction of the two. Participants rate the 'chances in 100'³ that each of the three statements is true. A conjunction fallacy error is made when the third (conjunction) statement is rated as being more likely than one or both of the singular constituent statements.

Of the 16 original vignettes, 8 describe neutral events, such as the outcome of a horse race and the clientele of a café. The remaining 8 items each had a paranormal theme; that is, each was designed such that the conjunction statement could imply that a paranormal event had taken place. As the current study was not concerned with paranormal beliefs, these 8 items were dropped. In their place, 8 new vignettes were created, each with a conspiratorial theme. That is, in each case the conjunction statement could imply that a conspiracy had taken place. As an example, the following vignette was presented: "Patrick works for a pharmaceutical company testing the efficacy and side effects of some of the drugs they manufacture. He

³ While Rogers et al. (2009) employed a more explicitly frequency-based estimate (phrased as 'the number out of 100 occurrences') in addition to the 'chances in 100' response format, their analyses showed no difference between the two response formats. Accordingly, only the latter was used in the current study.

discovers that one of their widely available over-the-counter drugs is associated with an increased risk of heart disease.” Participants rate the likelihood that (a) “Patrick’s data gets lost after an I.T. failure affecting his computer”, (b) “Patrick is taken off the project”, and (c) “Patrick’s data gets lost after an I.T. failure affecting his computer and Patrick is taken off the project” (full wording of the 8 novel conspiracy-themed items can be found in Appendix 3.2).

A neutral example item (on which a conjunction error was not made) was included at the start of the M-SJQ to ensure participants understood the task instructions.

Procedure. Undergraduate students were approached to take part in research following a lecture on an unrelated topic. Volunteers were given the questionnaire as part of a larger questionnaire package (also containing Studies 5a and 5c). To avoid priming ideas of conspiracy theories, the word ‘conspiracy’ was not mentioned in the information sheet given to participants prior to filling in the questionnaire. The order of items in the M-SJQ was reversed for half of the participants; however, the M-SJQ was always presented before the GCB. Participants were instructed to complete all questionnaires as quickly as possible; however, no time limit was given.

Results

Data screening. Cases missing data on more than one conjunction or GCB item were excluded from analyses ($n = 1$). Further screening revealed 6 multivariate outliers, which were also excluded (total valid $N = 95$).

Belief in conspiracy theories. A mean GCB score was computed for each participant (potential range = 1 – 5; actual range = 1.47 – 4.33; median = 3.00). Mean GCB scores were approximately normally distributed. Males and females did not differ in terms of conspiracist beliefs ($t(93) = .83, p = .41, d = 0.17$), and there was no correlation between GCB scores and age ($r(93) = -.07, p = .50$).

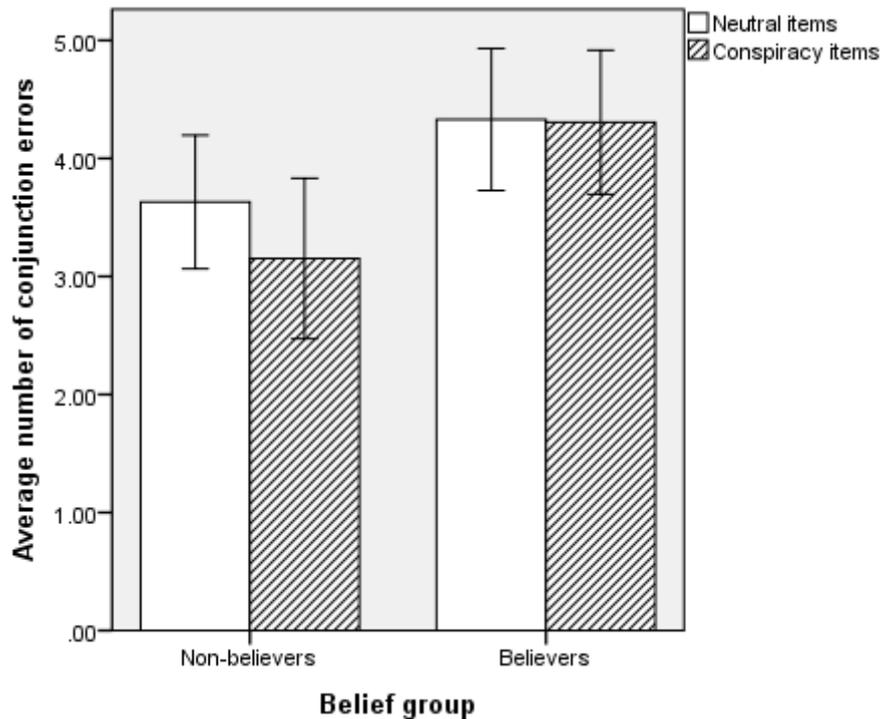
Susceptibility to the conjunction fallacy. The majority (93.7%) of the sample made at least 1 conjunction fallacy error among the 16 M-SJQ items. The average number of conjunction errors made by participants across all 16 items was 7.73 ($SD = 3.89$). Inspection of individual M-SJQ items showed that some proportion of the sample made conjunction errors for each of the 16 items (range 17.9 – 64.2%). A large proportion (92.6%) of the sample made at least 1 conjunction error for

neutral items ($M = 3.99$; $SD = 2.02$), with a slightly lower proportion (90.5%) for conspiracy items ($M = 3.75$; $SD = 2.27$).

Total number of conjunction errors correlated significantly with GCB scores ($r(93) = .29$, $p < .01$); stronger endorsement of conspiracy theories was associated with a greater number of conjunction errors. Looking at conjunction vignette types individually, GCB scores correlated significantly (and positively) with both neutral conjunction errors ($r(93) = .21$, $p < .05$) and conspiracist conjunction errors ($r(93) = .30$, $p < .01$).

To investigate the relationships further, including the potential interaction between conjunction type and conspiracist ideation, and to reproduce the analysis performed by Rogers et al. (2009), a 2 conspiracy belief group (believer vs. nonbeliever) x 2 event type (neutral vs. conspiracy) mixed ANOVA was performed on the number of conjunction errors made. Median split analysis was used to reclassify participants as either conspiracy ‘believers’⁴ ($n = 49$; $M = 3.42$; $SD = 0.38$) or ‘nonbelievers’ ($n = 46$; $M = 2.41$; $SD = 0.39$). The main effect of conspiracy belief group was significant ($F(1, 93) = 5.62$; $p < .05$; $\eta^2_p = .06$), with believers making slightly more conjunction errors in total ($M = 8.61$; $SD = 3.72$) than nonbelievers ($M = 6.78$; $SD = 3.88$). The main effect of conjunction event type was not significant ($F(1, 93) = 1.83$; $p = .18$; $\eta^2_p = .02$); while slightly fewer errors were made on conspiracy-themed items ($M = 3.75$; $SD = 2.27$) than neutral items ($M = 3.99$; $SD = 2.02$) on the whole, this difference did not reach significance. The interaction between event type and belief group also emerged as not significant ($F(1, 93) = 1.50$; $p = .22$; $\eta^2_p = .02$). These effects are illustrated in Figure 3.1.

⁴ It may be more appropriate to refer to ‘moderate’ vs. ‘low’ believers; however, the ‘believer/nonbeliever’ terminology is retained here for convenience, as per previous research (Rogers et al., 2009).



Note. Error bars: 95% CI.

Figure 3.1. Average number of conjunction fallacy errors for each item type by belief group.

Discussion

The aim of the present research was to test the hypothesis that people who endorse conspiracy theories are more susceptible to the conjunction fallacy. The data support this notion. Consistent with previous research (Agnoli & Krantz, 1989; Fiedler, 1988; Fisk & Pidgeon, 1996, 1997, 1998; Rogers et al., 2009, 2011; Tversky & Kahneman, 1983; Wolford et al., 1990), people on the whole committed a sizeable number of conjunction errors, regardless of the context in which the conjunction was presented (neutral or conspiratorial). Crucially, individuals who indicated stronger endorsement of generic conspiracist ideas committed a greater number of conjunction violations than people who indicated lower conspiracist ideation.

This trend was largely unaffected by context. The conjunction error rate among conspiracy-believers was higher to the same extent across neutral and conspiracy-themed conjunction scenarios. This implies that individual differences in susceptibility to the conjunction fallacy are domain general. It does not seem to be the case that some unique feature of conspiracist narratives preferentially invokes the fallacy in conspiracy-believers. Rather, it seems that individuals who are prone to

making conjunction errors in general are more accepting of conspiracy theories, perhaps because such theories often rely on a confluence of events being subsumed under a singular narrative. In this way, conspiracy theories may appear more representative of events in general to individuals who typically perceive conjunctions as being more representative than singular events.

Previous research found lower conjunction violation rates for paranormal scenarios as compared to nonparanormal conjunction items, regardless of participants' level of endorsement of the paranormal (Rogers et al., 2009, 2011). Unexpectedly, the present study found no difference in conjunction error rates between neutral and conspiracy-themed items – both invoked similar numbers of fallacies. One possible explanation for this is that paranormal scenarios are perceived to some extent as inherently implausible, as they contradict mainstream materialist views of reality. Consistent with this suggestion, previous research has found that supernatural attributions are invoked less frequently than naturalistic explanations (Lupfer & Layman, 1996). Conspiratorial scenarios, however, do not possess the same obvious implausibility. Real conspiracies take place in the world routinely. As the working definition provided in Chapter 1 illustrated, the kinds of claims commonly referred to as 'conspiracy theories' diverge from real, mundane conspiracies in less obvious ways, such as in postulating preternaturally powerful and evil conspirators, dismissing more plausible explanations, and distorting contrary evidence (Aaronovitch, 2009; Bale, 2007; Barkun, 2003; Keeley, 1999).

However, it is possible that the conspiracy-themed conjunction items used in the current study did not clearly differentiate between mundane conspiratorial activity and the kinds of implausible machinations postulated by typical conspiracy theories. The novel conspiracy-themed items used in the present research were designed such that the conjunction response option implied that some kind of sinister conspiracy had taken place. Efforts were made to ensure that these items reflected the themes evident in prototypical popular conspiracy theories – primarily the covering up (in some cases by lethal means) of inconvenient truths. The actors behind the various implied conspiracies were the kinds of groups typically guilty of such misdeeds according to popular conspiracy theories, such as government officials, the pharmaceutical industry, and secret societies. Future research may seek to systematically vary factors such as the implied perpetrators or the scale of the alleged conspiracy and its consequences to see if such variables have an effect on

conjunction violation rates. At any rate, the increased rate of conjunction violations across neutral and conspiracy-themed items suggests that the relationship between conspiracist ideation and the conjunction fallacy is reliable.

The power of the study may have been slightly reduced by the lack of variation in GCB scores. For the purposes of median-split analyses, only one scale point separated the 'believers' group from the 'nonbelievers' group. This is likely a result of the relatively homogenous sample of undergraduate students used. A stronger effect may have been seen with a more heterogeneous group of participants in terms of beliefs about conspiracy theories. That a difference between the believers and nonbelievers group in terms of number of conjunction errors made was still observed despite the homogeneity of the current sample suggests that it is a robust effect.

One possible explanation for greater susceptibility to the conjunction fallacy among people who believe conspiracy theories is that, like those who believe in the paranormal (e.g. Blackmore & Troscianko, 1985; Bressan, 2002; Brugger & Taylor, 2003), conspiracy-believers have a biased conception of randomness, according to which coincidences are rarely mere chance occurrences. Rather, causal relationships are inferred, which render conjunctive events more subjectively representative, and thus more plausible, than singular events (Nestler, 2008; Tversky & Kahneman, 1983; see also Koslowski, Marasia, Chelenza, & Dublin, 2008). Conspiracy theories often hinge on the idea that many disparate and ostensibly unrelated observations are, in fact, causally related by a conspiratorial plot. Thus, the tendency to perceive such conjunctions as being typical, or representative, may imbue such theories with plausibility.

Yet, the current study is correlational and thus cannot confirm this speculated causal relationship; it remains unclear whether susceptibility to the conjunction fallacy causes, or conversely is caused by, endorsement of conspiracy theories. Given that susceptibility does not appear to be domain specific, and that other products of the representativeness heuristic have been implicated in the formation of conspiracist beliefs (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; see also Chapter 4 of this thesis), the former seems plausible. However, it is worth noting that the two causal directions are not necessarily mutually exclusive. A reciprocal process may occur, whereby a biased conception of randomness predisposes an individual

towards accepting conspiracy theories, which in turn reinforces a worldview in which ostensibly unrelated events have hidden causal connections.

General discussion

The two studies described in this chapter contribute to the small body of findings concerning the role of nonconscious cognitive biases in the evaluation of conspiracist claims. Given evidence that the representativeness heuristic can influence the adoption of anomalous beliefs (e.g. Gilovich & Savitsky, 2002), the current research aimed to explore the heuristic's role in conspiracism. Specifically, the studies reported in this chapter focused on two biases, the conjunction fallacy and the proportionality bias, which are thought to result from the representativeness heuristic. Both biases have previously been found to influence anomalistic beliefs (Lupfer & Layman, 1996; Rogers et al., 2009, 2011). It was argued that certain characteristics of conspiracy theories – in particular, the focus on events of large magnitude and the tendency to incorporate conjunctive events into a coherent narrative – make these biases promising candidates in the search for cognitive factors underlying belief in conspiracy theories. Support for the hypotheses that conjunction and proportionality biases serve to make conspiracy theories appear more plausible was, however, mixed.

Study 5a focused on the proportionality bias. Research suggests that this bias can make certain anomalous claims appear plausible for significant events, such as declaring a life-changing event to be an act of God (Lupfer & Layman, 1996). Research suggests that the proportionality bias may also make conspiracy theories seem plausible for significant world events because they offer to explain events in terms of an equally significant conspiracy (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; McCauley & Jacques, 1979). The current study, however, failed to replicate this effect. According to the current data, there was no relationship between the magnitude of the event and the likelihood of a conspiracist explanation being favoured. Instead, conspiracy theorising about a novel event was associated only with generic conspiracist ideation; novel conspiracist attributions were determined by the degree to which an individual tended to entertain conspiracy theories in general (see Goertzel, 1994; Imhoff & Bruder, 2013; Swami et al., 2010). This suggests that the vignettes used in the current study may have simply failed to invoke the

proportionality bias, leaving conspiracist attributions to be determined by stable individual differences in conspiracism.

Study 5b concerned the conjunction fallacy. Under conditions of uncertainty, people's statistical intuitions are often at odds with objective laws of probability. In particular, people often misperceive the co-occurrence of ostensibly unrelated events as being more likely than the occurrence of either component event alone. The current findings suggest that people who endorse conspiracy theories are particularly susceptible to this conjunction fallacy. While the current study cannot directly establish causality, taken together with previous research (Rogers et al., 2009, 2011), the findings suggest that the representativeness heuristic can render conjunctive events as more plausible than the singular, constituent events alone, and that individual differences in susceptibility to this conjunction fallacy predict beliefs about real-world events. As conspiracy theories often rely upon the conjunction of otherwise unrelated details being attributed to a unifying conspiracist narrative, those who are more susceptible to the conjunction fallacy in general may be more open to the possibility that conspiratorial activity is ubiquitous.

In sum, despite the failure to replicate previous findings concerning conspiracist ideation and the proportionality bias, the current findings suggest that representativeness can play a role in the adoption of conspiracist beliefs, including via the conjunction fallacy. However, the relationships, particularly in the case of the proportionality bias, may be more complex or more difficult to invoke than initially hypothesised. Future research must consider carefully the manipulations and measurement devices used in an attempt to elicit biases in order to further examine the conditions under which biases influence reasoning about novel events. The next chapter aims to continue this line of research, focusing on another bias which may result from the representativeness heuristic – a preference for attributions of intentionality.

Chapter 4

Representativeness Continued: Conspiracist Ideation and Judgements of Intentionality

Introduction

As the introduction to the previous chapter outlined, the representativeness heuristic dictates that the greater the correspondence between salient features of an event and a potential explanation, the more plausible the explanation will appear. Salient features can include physical properties such as size or volume, as well as psychological attributes such as emotional valence or magnitude (e.g. Ebel-Lam et al., 2010; Gilovich & Savitsky, 2002; Kahneman & Tversky, 1972; LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; Lupfer & Layman, 1996; McClure et al., 1991; Spina et al., 2010; Teigen, 2004). The current chapter presents a series of studies examining the role of another psychological attribute – intentionality. This chapter is guided by the hypothesis that, to the extent that an individual tends to regard ambiguous events or situations as having been intended, the representativeness heuristic may make intentional explanations – and thus conspiracy theories – appear more plausible than unintentional explanations.

Inferring intent

Everyday social interaction depends on judgements of *intentionality*. This refers to the ability to distinguish intentional actions and consequences from unintentional acts or outcomes, and to infer the specific intentions motivating people's actions. Judgements of intentionality are integral to understanding and participating in routine social interactions such as conversation (Holtgraves, 2008), interpreting a particular individual's behaviour over time (for example, how a doctor's various actions are united by the common goal of healing patients) (Baldwin & Baird, 2001), as well as understanding more abstract social enterprises such as theatre or literature (Bower & Rinck, 1999; Trabasso & Nickels, 1992). Deficits in the ability to comprehend the mental states of others are characteristic of autistic spectrum disorders (Baron-Cohen, 1997, 2009; however, see Channon, Lagnado, Fitzpatrick, Drury, & Taylor, 2011) and damage to certain brain regions (Channon,

Lagnado, Drury, Matheson, & Fitzpatrick, 2010), and can lead to severe difficulties in everyday life (Baldwin & Baird, 2001).

Clearly, interpreting the intentions of those around us is not a trivial intellectual exercise. Interpretation of an actor's intentions guides beliefs about, and behaviour towards, the actor. Dodge, Murphy, and Buchsbaum (1984) examined children's reactions to observed schoolroom altercations involving an ambiguous act, such as one child knocking over a tower of blocks that another child had constructed. Such an act might be a deliberately hostile act of provocation, an accident, or may even be a prosocial act – the child may have been helping to dismantle the tower in order to tidy up. The authors found that when the ambiguous action was interpreted as hostile the observer was more likely to respond with aggression aimed at the perpetrator. In adulthood, too, ambiguous provocative actions judged to be intentional generate more hostile or punitive reactions (Buon, Jacob, Loissel, & Dupoux, 2013; Lagnado & Channon, 2008). The consequences of attributing intent can be severe. In criminal trials, juries may be tasked with determining whether a criminal act was intentional or unintentional; the distinction can mean the difference between a verdict of first-degree murder and one of manslaughter (Malle & Knobe, 1997).

Given the importance of inferring the intentions of others, it is not surprising that the cognitive system is keenly attuned to intentionality cues. The ability to perceive and infer intentionality appears to be driven by low-level, automatic processes (Baldwin & Baird, 2001; Blakemore & Decety, 2001; Rosset, 2008). Just observing another person carrying out a simple action, such as raising a glass of water to their mouth, evokes judgements of whether the behaviour is intended and what goals the actor may be hoping to achieve (in this case, it may be inferred that the person is thirsty and plans to take a drink). The perceiver's cognitive system does not encode every intricate detail of the actor's physical motion in space; rather, the information that gets encoded is the perceiver's interpretation of the actor's actions in terms of these automatic inferences about the actor's mental state (Blakemore & Decety, 2001). When a specific intention has been ascribed, actions relevant to that intention are preferentially encoded, while intent-irrelevant actions are more likely to be disregarded and forgotten (Zadny & Gerard, 1974).

The cognitive architecture underlying the ability to discern intentionality begins development in early infancy. Infants as young as 3 months appear able to

discriminate ostensibly intentional from unintentional motion (Rochat, Morgan, & Carpenter, 1997), and by 14 months children preferentially imitate apparently intended actions (Carpenter, Akhtar, & Tomasello, 1998). The ability to accurately infer the specific content of another person's intentions – what exactly they might hope to achieve through their actions – develops throughout childhood (Dodge et al., 1984). By adulthood, most neurotypical individuals share a common understanding of the concept of intentionality, even in lieu of an explicit definition (Malle & Knobe, 1997).

Overattribution of intentionality

The fast and automatic operation of intentionality-seeking cognitive processes allows us to quickly make inferences about the mental states of those around us – an important evolutionary adaptation (Atran & Norenzayan, 2004). However, as is the case with other low-level cognitive processes (e.g. Gilovich et al., 2002; Pohl, 2004), inferences of intentionality may be subject to biases and heuristics. Not only are we sensitive to the intentions of others, but we may be *overly* sensitive, biased towards perceiving or inferring intentionality where it is not warranted.

Of course, an adult who observes another person sneeze, for example, may be explicitly aware that the action was unintended. However, research suggests that this awareness is only arrived at secondarily through effortful application of the acquired knowledge that intentions are not the only possible causes of actions (Bègue, Bushman, Giancola, Subra, & Rosset, 2010; Kelemen & Rosset, 2009; Rosset, 2008). In particular, Rosset (2008) reports a series of studies suggesting that the low-level processes governing attributions of intentionality may be biased towards interpreting *all* actions as intentional, rather than accidental – even actions which are never performed intentionally, such as catching a cold. Only after the initial automatic attribution of intentionality has been made can higher-level cognitive processes evaluate this involuntary assumption. Thus, judging an action to be unintentional requires more cognitive resources, takes longer, and results in increased ease of recall compared to judging the same action to be intentional. Rosset (2008) refers to this irresistible inclination towards intentional attributions as the *intentionality bias*.

It must be noted that one attempted replication failed to find the same pattern of results (Hughes, Sandry, & Trafimow, 2012). However, the notion of an intrinsic intentionality bias is consistent with the wider body of research suggesting that intentional explanations are often preferred over unintentional or situational explanations, even when a more tenable unintentional explanation is available (e.g. Hughes & Trafimow, 2012; Jones & Harris, 1967; Kelemen & Rosset, 2009; Langer, 1975; P. H. Miller & Aloise, 1989; Sripada, 2012). Moreover, anthropomorphic intentions are often readily attributed to nonhuman animals, or inanimate objects and entities (e.g. Kelemen & Rosset, 2009; Kelemen, 2004; Waytz, Cacioppo, & Epley, 2010). Even abstract two-dimensional shapes moving around a screen are automatically imbued with human-like characteristics and intentions when they move in ways consistent with our expectations of intentional agency (Barrett & Johnson, 2003; Heider & Simmel, 1944; Scholl & Tremoulet, 2000). There appear to be stable individual differences in the tendency to favour intentional claims and explanations (Waytz et al., 2010). Further, attributions of intentional agency become more likely when processing time is limited or disrupted by consumption of alcohol (Bègue et al., 2010; Kelemen & Rosset, 2009; however, see Buon et al., 2013).

Some findings suggest that overattribution of intentionality may be associated with anomalistic beliefs. People who believe supernatural religious ideas are more inclined to find unwarranted signs of agency in the world around them, such as seeing faces in cloud formations or attributing agency to inanimate objects (Atran & Norenzayan, 2004; Boyer, 2003; Evans & Wellman, 2006; Kelemen, 2004; Petrican & Burris, 2012; Riekkki et al., 2013). Moreover, the tendency to endorse statements postulating some form of supernatural intentionality (such as “The sun radiates heat because warmth nurtures life”) increases under cognitive strain (Kelemen & Rosset, 2009), and when participants are made to feel powerless (Kay, Gaucher, McGregor, & Nash, 2010; Kay, Whitson, Gaucher, & Galinsky, 2009; Norenzayan & Hansen, 2006). These findings suggest that individuals who are inclined towards attributions of intentionality, either as a stable trait or due to situational factors, may see anomalous claims postulating supernatural agency as relatively more representative, and thus more plausible, than claims which do not entail intentionality.

Intentionality and conspiracy theories

So far this chapter has discussed research suggesting that inferences of intentionality are governed by low-level, automatic processes which are biased towards interpreting actions or events as having been caused intentionally. This can give rise to promiscuous and unwarranted judgements of intentionality. It was noted that the representativeness heuristic may lead to anomalous claims regarding supernatural intentionality being evaluated favourably because the claims are representative of a world in which intentionality is ubiquitous. The remainder of this chapter will examine the idea that conspiracy theories may also be, in part, a product of overdetection of intentionality.

This seems a reasonable speculation given that conspiracy theories invariably explain events in terms of intentional agency, offering a greater degree of *intendedness* – the amount of information that can be construed as intentional – than the mainstream explanations with which the theories compete. As the definition section of Chapter 1 noted, conspiracy theories characteristically portray the postulated conspirators as preternaturally competent in their ability to plan and control events, discounting the role of chance or unintended consequences. According to conspiracy theories nothing happens by accident.

The working definition also noted that a conspiracy theory invariably competes with a mainstream explanation. These mainstream accounts may or may not postulate an intentional explanation; in either case, the conspiracy theory usually offers a greater degree of intendedness. In some cases, a conspiracy theory competes with a mainstream explanation which casts the event as an unintended consequence, or the product primarily of chance. Such is the case with conspiracy theories of the death of Princess Diana or the catastrophic failure of TWA flight 800, for example (see McConnachie & Tudge, 2008). Here it is clear that a conspiracy theory explaining the event as the product of the conspirators' intentions offers more intendedness.

In other cases, however, both conspiracy theory and mainstream account explain the event in question as intentional. Take, for example, the terrorist attacks of 9/11. The mainstream account proposes that al-Qaeda hijackers acted successfully on their intentions to crash airliners into the World Trade Center towers. Likewise, conspiracy theories of the event allege that conspirators within the US government intentionally perpetrated the attacks. Why might a conspiracy theory be preferred in

this case, when both mainstream and conspiracist accounts offer intentionality? On closer examination, the mainstream account inherently involves unintended consequences: the government agencies tasked with identifying terrorist threats certainly did not intend for the attacks to occur. The conspiracy theory, in contrast, offers a surplus of intendedness. Not only were the buildings attacked on purpose, but the government agencies were in on the entire plot, purposefully failing to prevent the attacks. Viewed in this way, mainstream explanations of events like 9/11, the assassination of President John F. Kennedy, and similar events inherently entail unintentional consequences, whereas conspiracy theories offer to explain almost all consequences as intended.

With this in mind, it seems reasonable to suggest that individuals who are more susceptible to the intentionality bias⁵ in general will find conspiracy theories to be more plausible than their corresponding mainstream explanations. In the same way that the representativeness heuristic can make large causes seem plausible for large events (see Chapter 3, Study 5a), so too might intentional explanations appear more plausible to an individual who sees events in general as being suffused with intentionality.

As the previous section noted, this bias appears to make explanations postulating supernatural intentionality appear more plausible to certain people in certain circumstances (e.g. Atran & Norenzayan, 2004; Kelemen & Rosset, 2009; Norenzayan & Hansen, 2006; Petrican & Burris, 2012). Conspiracy theories, too, may be evaluated favourably to the extent that they are consistent with an individual's conceptions of intentionality. Endorsement of both supernatural claims and conspiracy theories has been found to increase under conditions of diminished self-efficacy (Grzesiak-Feldman, 2013; Sullivan et al., 2010; Whitson & Galinsky, 2008). Together with reliable correlations between conspiracism and supernatural beliefs (e.g. Bruder et al., 2013; Darwin et al., 2011; Swami et al., 2011), these findings suggest potential psychological similarities between reasoning about conspirators and supernatural agents. Both forms of anomalous beliefs may result from a preference for explanations which posit intentional agency as the primary cause of events in the world.

⁵ Or, put another way, individuals who are less able or inclined to over-ride the intentionality bias, either as a result of stable individual differences or temporary situational factors.

One potential difference between reasoning about conspiracies versus supernatural or everyday agents is that intentionality, as it is usually conceived, applies to lone agents. Whether they are gods, ghosts, or humans, intentional agents are usually discrete individuals. A conspiracy, on the other hand, is a collective working together towards a common goal. It is possible that reasoning about a conspiracy would not invoke the same cognitive processes which deal with judgements of intentionality. However, research suggests that, in some circumstances, people attribute intentionality to a group entity (such as a sports team, a country, or even a group of simple geometric shapes moving around a screen in formation) to the same extent as to individual entities (Bloom & Veres, 1999; Waytz & Young, 2011). Thus, there is reason to suspect that intentionality judgements concerning a conspiracy, a supernatural agent, or a mere human, rely upon the same underlying cognitive processes.

To date, just three studies have touched upon this speculation, providing preliminary support. Imhoff and Bruder (2013) report that people who indicated stronger beliefs in conspiracies in general were more likely to blame a specific real-world disaster – the 2011 Fukushima Daiichi nuclear power plant catastrophe – on intentional misconduct rather than chance. Bost and Prunier (2013) found that people were more accepting of conspiracist claims when presented with an obvious motive for the alleged conspiracy, suggesting that the conspirators were intentionally working towards a desirable goal. Additionally, generalised conspiracist ideation has been found to correlate positively with individual differences in anthropomorphism (Bruder et al., 2013; Imhoff & Bruder, 2013). Both findings point towards a link between conspiracist ideation and promiscuous attributions of intentionality.

Overview of studies

In sum, there is reason to suspect that a claim postulating a conspiracy may invoke cognitive processes governing attributions of intentionality. Research suggests that these processes attribute intent automatically, and that replacing judgements of intent with an unintentional attribution is a cognitively effortful process (Rosset, 2008). Further, individuals appear to vary in their capacity to override this intentionality bias, either as a stable disposition (Waytz et al., 2010), or due to situational factors (Bègue et al., 2010; Kelemen & Rosset, 2009; Norenzayan & Hansen, 2006); that is, everyone is subject to the intentionality bias, but some

individuals tend to favour intentional explanations, while others are more inclined to replace automatically generated intentional attributions with unintentional explanations. Those who favour attributions of intentionality appear to be more accepting of anomalistic claims postulating powerful supernatural agents, as such claims will appear representative (e.g. Atran & Norenzayan, 2004; Kelemen & Rosset, 2009; Norenzayan & Hansen, 2006; Petrican & Burris, 2012).

The four studies reported here were each driven by the hypothesis that individuals who generally favour intentional explanations for ambiguous events or outcomes may see conspiratorial explanations, which paint events as the product of powerful hidden agents' intentions, as being more subjectively representative, and thus more plausible, than nonconspiracist explanations. That is, conspiracist ideation is predicted to be stronger among individuals who are more prone to promiscuous inferences of intentionality. Attributions of intentionality are examined in the context of imagined actions (Study 5c and 8), perceived actions (Study 6), and anthropomorphism (Study 7 and 8).

Study 5c: Conspiracist ideation and inferences of intentionality

This first study aimed to provide an initial test of whether there is an association between conspiracist ideation and the extent to which an individual is biased towards *inferences* of intentionality – that is, attributions of intentionality in the context of ambiguous imagined actions. Previous research suggests that people high in conspiracist ideation are more likely to explain a real-world event as the result of intentional conspiratorial misconduct (Imhoff & Bruder, 2013). The current study, however, presents the first examination of whether people high in conspiracist ideation tend to prefer intentional attributions for ambiguous scenarios *in general* – that is, beyond the context of conspiracy. It is hypothesised that, since conspiracy theories offer to explain ambiguous events primarily in terms of agents' intentions, people who are generally inclined towards interpreting ambiguous actions or scenarios as having been intended will display higher levels of conspiracist ideation.

Method

Participants. Studies 5a, 5b, and 5c employed the same sample of 102 first-year psychology undergraduate students (81 females and 21 males). The majority

were of British (62.7%) or other European nationalities (27.5%). Participant age ranged from 18 to 44 years ($M = 21.0$, $SD = 5.2$).

Design. A correlational design was employed. The variables of interest were individual differences in conspiracist ideation, and inferences of intentionality.

Materials.

Generic conspiracist beliefs (GCB). General conspiracist beliefs were measured using the novel measure of generic conspiracist ideation described in Chapter 2 of this thesis. Cronbach's alpha for the scale was high (.88).

Inferences of intentionality. To measure individual differences in bias towards inferences of intentionality, a measure was adapted from previous research looking at the intentionality bias. Rosset (2008) created a list of 34 sentences, each describing an action that can be done either on purpose or by accident, such as "He set the house on fire," and, "She kicked the dog." Pretesting allowed the author to rank order the statements in terms of the percentage of participants who offered an intentional explanation for each. Some statements were almost never interpreted as intentional, such as "She burnt the meal." Some were almost always given intentional explanations, such as "She averted her eyes." Crucially, however, 12 sentences were more ambiguous, with between 27% and 69% of participants offering intentional interpretations. These 12 sentences were selected as test items for the current study.

Following Rosset's (2008, Study 2) methodology, each sentence was presented together with a space in which participants were asked to write "A brief description of the image that comes to mind when reading each sentence". As in Rosset (2008), two example sentences and potential responses were provided before participants began the task – one describing an intentional act ("He looked for his key: 'A guy is in front of his car and he's feeling his pockets for his keys, looking confused'"), and one describing an unintentional act ("She tripped on the curb: 'I see a girl on Oxford Street talking on her cell phone and tripping over the curb as she crosses the street'").

On turning the page after writing descriptions for all 12 sentences, participants received additional instructions asking them to "Go back to each of your responses and clarify whether the event you described was done on purpose or by accident." Participants were required to write the words 'on purpose' or 'by accident' after each of their descriptions on the previous page. This step was included in order

to avoid subjectivity in the coding of descriptions in which the intentions of the actor may be unclear – Rosset (2008) gives the example of the following response to the sentence “He dripped paint on the canvas”: “I see a guy in overalls holding a paint brush and looking down at a large canvas on the floor in a loft like building.” Here it is unclear whether the actor intended to drip the paint or not. As per Rosset (2008), participants were not asked for this clarification until after they had completed the open-ended description phase of the task so as to avoid priming participants to think of unintentional explanations which they may not have otherwise considered.

Procedure. Undergraduate students were asked to take part in research following a lecture on an unrelated topic in return for course credit. Volunteers were given the current questionnaire as part of a larger questionnaire package (see Studies 5a and 5b). To avoid priming the idea of conspiracy theories, the word ‘conspiracy’ was not mentioned in the information sheet given to participants prior to filling in the questionnaire. Two versions of the questionnaire pack, with the order of intentionality items counterbalanced, were randomly distributed. The intentionality measure was presented before the GCB. No time limit was given, though participants were asked to work quickly, answering with their first instincts.

Results

Data screening. Despite asking participants to clarify whether their descriptions of the ambiguous actions were on purpose or by accident in order to avoid experimenter subjectivity, initial examination revealed some seemingly incongruous responses; in some cases a participant’s description of an item suggested an action which was unambiguously accidental, yet they indicated that the action was purposeful, or vice versa. For example, one participant responded to the item “He set the house on fire” with the following description: “I see a man standing outside a burning building holding a petrol can and laughing maniacally.” This would ostensibly appear to describe an intentional act of arson; however, the participant rated the action as accidental.

Out of 1,224 (102 participants multiplied by 12 items each) items total, the author identified 30 ambiguous items (2.45%) such as these across 10 participants. These 30 ambiguous items, as well as 15 randomly chosen unambiguous control items, were presented to an independent rater who blindly coded each item as ambiguous or unambiguous. An interrater reliability analysis using the Kappa

statistic was performed to determine consistency between raters, revealing substantial agreement ($Kappa = 0.63; p < .001$). An item was excluded from subsequent analyses when both raters agreed that the item was ambiguous (24 items in total).

In addition to excluding individual ambiguous items, a participant's data were excluded entirely if more than one item was missing ($n = 5$) or ambiguous ($n = 7$). Four additional multivariate outliers were excluded from analyses (total valid $N = 86$).

Descriptive data. An intentionality score was computed for each participant by summing the number of intentional explanations each participant offered across the 12 items. Where a participant had a missing or excluded item, their total was adjusted by dividing by 11 and then multiplying by 12 to give a score equivalent to participants with complete data for all 12 items. On the whole, participants tended to offer intentional attributions for significantly more than half ($M = 7.47; SD = 1.52$) of the 12 items ($t(85) = 9.14, p < .001, d = 0.99$). The data was approximately normally distributed about the mean, with slight negative skew; scores ranged from 4 to 10 (median = 7; skew = $-.14$).

In addition, a mean conspiracist ideation score was computed for each participant by averaging their responses to the 15 GCB items. On the whole, participants demonstrated modest conspiracist ideation; the overall mean score was 2.90 ($SD = 0.64$), close to the mid-point of the scale. GCB scores were approximately normally distributed about the mean (range = 1.47 to 4.27; median = 2.97; skew = $-.14$).

Association between conspiracist ideation and intentional inferences.

There was a weak but significant positive correlation between GCB scores and the number of intentional inferences participants offered ($r(84) = .22, p < .05$); that is, participants who endorsed generic conspiracist claims more strongly tended to offer slightly more intentional interpretations.

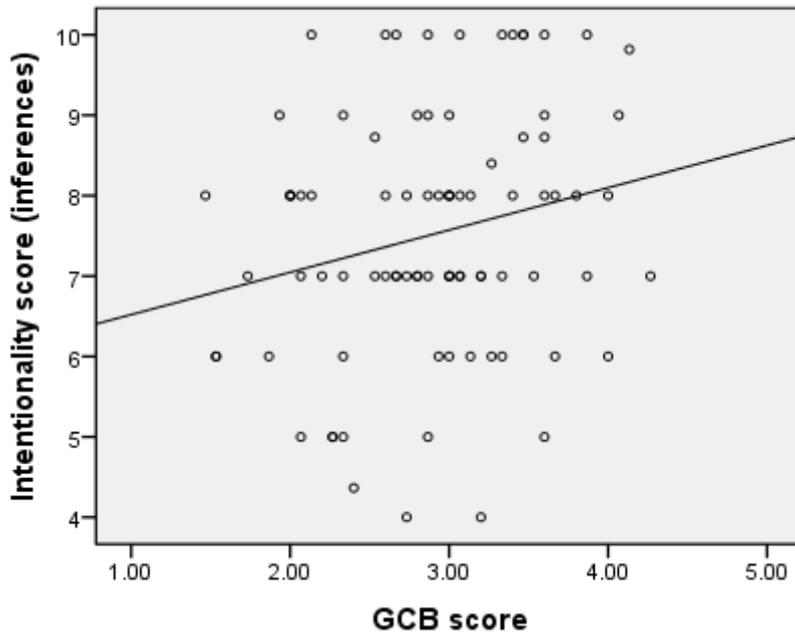
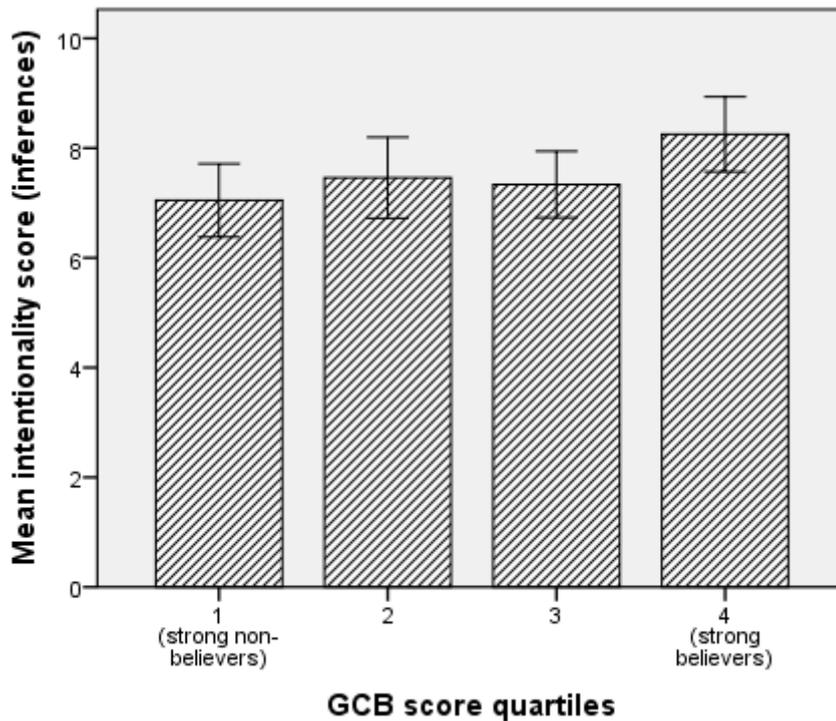


Figure 4.1. Scatterplot of number of inferences of intentionality against conspiracist ideation (GCB scores).

To explore the linearity of the relationship, GCB scores were divided into quartiles. Figure 4.2 illustrates the group means. A small upward trend is evident, with fewest intentionality inferences within the lowest quartile (strong nonbelievers), the greatest number of intentionality inferences within the highest quartile (strong believers), and the middle quartiles scoring in between. Comparing the highest quartile of the sample in terms of conspiracist ideation ($n = 21$; $M = 3.72$; $SD = 0.26$) with the lowest quartile ($n = 21$; $M = 2.03$; $SD = 0.27$), strong believers made a larger number of intentional attributions ($M = 8.25$; $SD = 1.46$) than strong nonbelievers ($M = 7.05$; $SD = 1.47$). This difference of just over 1 item emerged as statistically significant ($t(40) = 2.63$, $p < .05$; $d = 0.82$).



Note. Error bars: 95% CI.

Figure 4.2. Average number of inferences of intentionality among quartile groups derived from GCB scores (lowest to highest).

Discussion

The present study aimed to investigate the hypothesis that individuals who are more inclined to infer intentionality when presented with descriptions of ambiguous actions will view conspiracy theories more favourably. The data were consistent with this hypothesis. Participants who endorsed generic conspiracist claims more strongly tended to offer a greater number of intentional attributions in response to ambiguous actions such as “He set the house on fire.” However, the relationship was small; comparing the lowest quartile of the sample in terms of conspiracist ideation with the highest quartile reveals a difference of just over 1 item out of 12.

The study raises some issues concerning the operationalisation of individual differences in intentionality inferences that future research using the current measure might take into consideration. Particularly, cases of apparent incongruence between the description a participant offered for an item and their explicit rating of ‘on purpose’ or ‘by accident’ suggests that a small minority of participants may not have interpreted the task instructions in the same way as other participants. Ambiguous

cases such as these may reflect differing interpretations of the concept of intent. For instance, a pyromaniac may be deemed to not be legally responsible for their actions by virtue of temporary insanity. As far as the current research is concerned, though, the act was intentional: the actor intended to bring about the observed consequences through their actions. Alternatively, some ambiguous responses may simply reflect misunderstanding of the task. Of potential relevance is the fact that 8 of the 9 participants with ambiguous responses indicated non-British nationality or non-Caucasian ethnicity. It is possible that cultural differences or language barriers affected some participants' performance on the task. Study 8, which uses the same ambiguous sentences task, was designed with these issues in mind. First, however, Studies 6 and 7 sought to examine promiscuous attributions of intentionality in differing contexts.

Study 6: Conspiracist ideation and perceived intentionality

The previous study concerned *inferred* intentionality; that is, judgements of intentionality in response to imagined hypothetical events. The current study turns to intentionality judgements in the context of *perceived* intentionality. This refers to situations in which an ambiguous event is observed, rather than imagined. Evidence suggests that judgements of intentionality are automatically evoked when observing an actor in motion (Baldwin & Baird, 2001; Blakemore & Decety, 2001), and can even actively shape the perception of action (Zadny & Gerard, 1974). It is unclear, however, whether the cognitive processes underlying perceptions of intentionality are subject to the same intentionality bias as those underlying inferences of intentionality (Rosset, 2008). If the intentionality bias pervades both perceptual and inferential intentionality-oriented processes, it is expected that, like inferences of intentionality, a bias towards perceiving intentionality will be associated with stronger conspiracist ideation.

Method

Participants. One-hundred-and-twenty-nine adults completed the study (57 females and 71 males; no gender data for 1 participant). Age ranged from 21 to 75 ($M = 42.8$, $SD = 13.0$). The majority of participants were British or Irish (74.4%); the remainder of the sample was of European (10.9%), North American (9.3%), or other

nationalities (5.4%). Participants were primarily in employment (66.7%), students (13.2%), or unemployed/retired (13.9%).

Design. A correlational design was employed. The variables of interest were general conspiracist ideation, and bias towards perceiving intentionality when observing another person performing an ambiguous movement.

Materials.

Generic Conspiracist Beliefs scale. General conspiracist beliefs were again assessed using the measure of generic conspiracist ideation described in Chapter 2 of this thesis. Cronbach's α for the scale was again high (.92).

Perceived intentionality. The ambiguous intentionality stimuli consisted of a series of 16 videos showing a close-up shot of a person's hand resting on a computer keyboard. The index finger is attached to a keyboard key via a Velcro strap, and the key itself is attached to a pulley system (see Figure 4.3). The pulley system is operated by an unseen motor which pulls the key (and finger) down, simulating a normal key-press. Thus, a key-press could either be actively carried out by the actor (intentional), or passively operated by the pulley system (unintentional). Participants were led to believe that each video in the series would show a different movement, and that each could be either intentional or unintentional. In actual fact, all videos in the series show an identical unintentional movement driven by the pulley system.

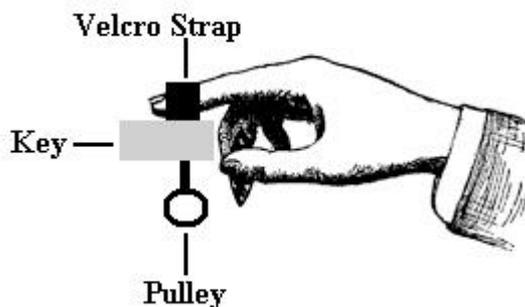


Figure 4.3. Schematic illustration of key-pressing apparatus.

Four versions of the video were created, differing only in the duration of the lead-in time before the movement is initiated (25 frames, 36 frames, 49 frames, 60 frames). The movement itself occupies 9 frames (approximately 360ms). All videos were 100 frames long (4-seconds at 25 frames-per-second).

In order to familiarise participants with the video stimuli and procedure, participants were shown a schematic representation of the apparatus (Figure 4.3) along with a written explanation. Following this, an example video was presented. This example page contained the instructions, “We ask that you watch each video just once all the way through, though please replay the video if you aren't able to see the finger movement for any reason. After each video, you'll be asked whether you thought the movement was made deliberately by the person (intentional), or made by the pulley system pulling the finger down (unintentional). Try to answer quickly, going with your first instinct.”

Participants were then asked to click a button to advance to the test phase. The test phase sequentially presented each of the 4 videos 4 times, for a total of 16 trials. The 4 videos repeated in a fixed pseudorandom pattern. After viewing a video, participants were asked to select one option from two buttons labelled ‘Intentional’ and ‘Unintentional’. Once participants had viewed a video and selected their response, they clicked a button in order to load a new webpage containing the next video.

Procedure. Participants were solicited online by emailing lists of people interested in taking part in anomalous psychological research. Self-selected volunteers completed the survey remotely via a web-based interface. Participants were asked to work alone in an environment free from distractions and to complete the study in a single sitting. To avoid priming ideas of conspiracy theories, the word ‘conspiracy’ was not mentioned in the information given to participants prior to filling in the questionnaire. To disguise the fact that all videos were identical, the study was presented as a survey looking at people’s ability to perceive subtle differences between intentional and unintentional movements. No time limit was given, though participants were asked to respond as quickly as possible, going with their first impressions.

Results

Data screening and descriptives. No cases were missing data for more than one item; thus, none were excluded. No bivariate outliers were identified.

A mean GCB score was calculated for each participant. GCB scores were approximately normally distributed. On the whole, participants demonstrated modest scepticism towards conspiracist ideas ($M = 2.11$; $SD = 0.79$). Males and females did

not differ significantly in terms of conspiracist ideation ($t(126) = 1.48, p = .14, d = 0.26$); nor did the two major nationality groups (British & Irish/Other nationalities) represented by the sample ($t(127) = 1.58, p = .66, d = 0.28$). There was no significant correlation between conspiracist ideation and age ($r(127) = -.12, p = .18$).

Second, a *perceived intentionality* score – the number of intentional attributions made by each participant in response to the ambiguous videos – was calculated for each participant. Where participants were missing an item, their total was adjusted by dividing the number of intentional attributions by 15 and multiplying by 16, to give a score comparable to participants with valid data for all 16 items. On the whole, participants interpreted significantly more than half ($M = 9.15; SD = 3.22$) of the 16 ambiguous videos as being intentional ($t(128) = 4.06, p < .001, d = 0.36$). Scores covered the entire spectrum, ranging from 0 to 16, however slight negative skew was evident (skewness = $-.13$).

Association between conspiracist ideation and perceived intentionality.

The correlation between mean GCB scores and perceived intentionality scores was nonsignificant ($r(127) = -.13, p = .16$). That is, there was no readily apparent association between conspiracist ideation and the number of intentional attributions a participant offered.

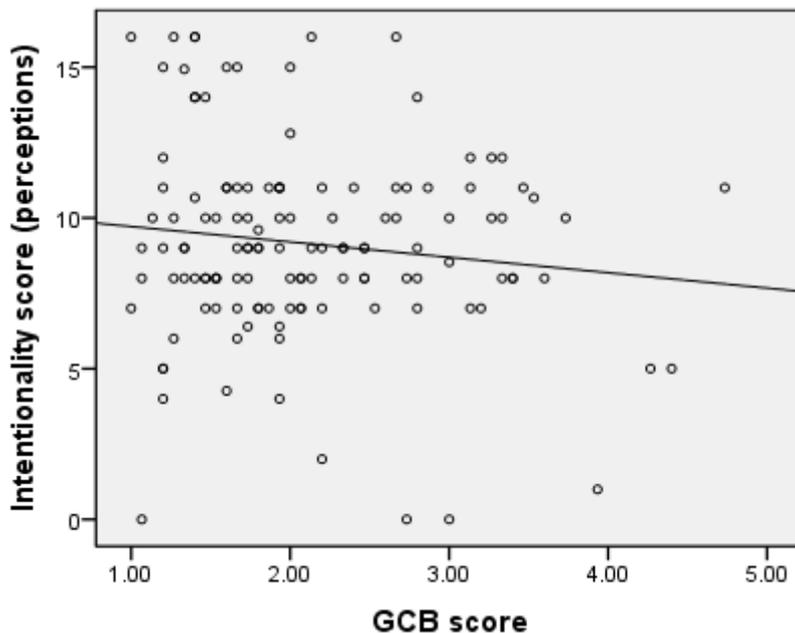


Figure 4.4. Scatterplot of GCB scores against number of intentional attributions.

Discussion

This study aimed to examine whether biases in the perception of intentionality are associated with conspiracist ideation. It was predicted that a bias towards perceiving intentionality would be associated with stronger endorsement of generic conspiracist beliefs. The data did not support this hypothesis, however; no reliable linear correlation was apparent. There was a slight trend towards a negative correlation, contrary to expectations, but this trend failed to reach statistical significance. Therefore it is not possible, on the basis of the current findings, to say that a bias towards interpreting perceived actions as intentional is associated with belief in conspiracy theories.

This failure to find a relationship is seemingly at odds with findings from the previous study, in which a bias towards interpreting imagined actions as intentional was found to correlate with greater endorsement of conspiracist beliefs (see also Imhoff & Bruder, 2013). It is perhaps worth noting that the current sample, on the whole, was slightly more sceptical towards conspiracy theories than the samples used in the other studies in this chapter. As Figure 4.4 illustrates, the sample consisted of many individuals with low conspiracist ideation, but few high in conspiracist ideation. This may be a result of the recruitment methods used in the current study. Unlike Study 5c, which sampled university students, the current study solicited volunteers from databases of people interested in anomalistic psychological research. It is possible that this approach resulted in a sample biased towards disbelief in conspiracy theories and other anomalous beliefs. Chapter 2 suggested that the GCB retains acceptable psychometric properties when used with self-selected samples of the general public; however the possibility remains that the skew of the current sample resulted in less statistical power than other studies, obscuring any genuine relationship. Future research should take care to recruit samples representative of a range of conspiracist beliefs.

Assuming that the current findings are not simply a result of a biased sample or low statistical power, one possible explanation for the disparity is that the ambiguous videos task employed in the current study failed to successfully capture individual differences in participants' bias towards intentional attributions. However, like the previous study, responses to the current task did suggest the presence of an intentionality bias. If participants were merely guessing in an unbiased fashion, half of the ambiguous key-presses ought to have been seen as intentional, and half as

unintentional. On the whole, however, participants interpreted slightly more than half of the key-presses as having been intentional. It is possible that some feature of the videos themselves, rather than an automatic cognitive bias, inclined participants towards attributions of intentionality; however, the fact that in reality all videos depicted an unintentional movement makes this explanation somewhat implausible. It is also possible that the unusual nature of the task may have caused participants to become suspicious, and to question their initial attributions more than they would in a more naturalistic setting, thereby disrupting the underlying individual differences which the measure hoped to assess. Indeed, in post-questionnaire comments, some participants anecdotally indicated suspicion that all videos were identical. Future research may consider using a more naturalistic task.

A second possibility is that reasoning about the intentionality of perceived events is different in some way from inferring the intentionality of imagined events, such that only biases in inferences are associated with beliefs about conspiracies. Lending plausibility to this suggestion, some research indicates that factors which influence the perception of physical causality do not necessarily influence inferences of physical causality (Johnston, 2013; Schlottmann & Shanks, 1992). It is possible that the same dissociation exists when reasoning about social causality – that is, whether an observed event was intended or unintended. This possibility is considered at greater length in the general discussion.

A final possibility is that Study 5c produced a spurious correlation, and in fact there is no relationship between biased judgements of intentionality and belief in conspiracy theories. With this possibility in mind, it is important to replicate the finding, and to look at biased judgements of intentionality in another context. The next two studies aimed to achieve these goals.

Study 7: Individual differences in anthropomorphisation

Overattribution of intentionality is not limited to ambiguous actions performed by humans. As mentioned in the chapter introduction, nonhuman animals or inanimate objects and entities are often attributed human-like intentionality (e.g. Barrett & Johnson, 2003; Bloom & Veres, 1999; Heider & Simmel, 1944; Scholl & Tremoulet, 2000; Waytz & Young, 2011). This tendency is referred to as anthropomorphisation. Individuals differ in their proclivity to anthropomorphise, and these individual differences have been found to influence more specific beliefs,

including attributions of responsibility and blame, and feelings of care and concern toward anthropomorphised entities (Waytz et al., 2010).

Some findings indicate that religious beliefs are associated with anthropomorphism (Petrican & Burris, 2012), suggesting that anomalous beliefs about supernatural agents may appear especially plausible to those who generally see the world as suffused with intentionality. Likewise, two studies have found evidence of a modest but reliable positive association between individual differences in anthropomorphism and conspiracist ideation (Bruder et al., 2013; Imhoff & Bruder, 2013). The current study aimed to replicate the relationship between conspiracist ideation and anthropomorphism using the measure created in Chapter 2. A positive association would bolster support for the hypothesised more general link between promiscuous attributions of intentionality and conspiracism.

Method

Participants. Eighty-four undergraduate psychology students at two London-based universities completed the study. Gender, age, and nationality were not recorded. No reward was offered for taking part.

Design. A correlational design was employed. The variables of interest were individual differences in conspiracist ideation and anthropomorphism.

Materials.

Generic conspiracist beliefs (GCB). General conspiracist beliefs were again assessed using the measure of generic conspiracist ideation described in Chapter 2 of this thesis. Cronbach's alpha for the scale was high once again (.90).

Individual Differences in Anthropomorphism Questionnaire (IDAQ: Waytz et al., 2010). Anthropomorphism refers to the attribution of human characteristics, including intentions, to nonhuman entities. The IDAQ consists of 15 items assessing the degree to which individuals tend to anthropomorphise nonhuman animals and inanimate objects (example item: "To what extent does a television set experience emotions?"). Participants respond on a Likert-type scale ranging from 1 ("Not at all") to 10 ("Very much"). Internal reliability in the current study was high (.88).

Procedure. Students were approached to take part in research following lectures on unrelated topics. Volunteers were given printed questionnaire packs. The IDAQ was always presented before the GCB. Again, the word 'conspiracy' was not mentioned in the information sheet presented to participants prior to filling in the

questionnaire. No time limit was given, though participants were asked to work quickly, answering with their first instincts.

Results

Data screening and descriptives. No cases were missing data for more than one item; thus, none were excluded. Mean GCB and IDAQ scores were calculated for each participant. One bivariate outlier was excluded from analyses (total valid $N = 83$).

GCB scores were approximately normally distributed. On the whole, participants demonstrated modest scepticism towards conspiracist ideas ($M = 2.43$; $SD = 0.76$). IDAQ scores showed slight positive skew (skewness = 0.70). Participants were generally somewhat disinclined to anthropomorphise, evident from a grand mean somewhat below the mid-point of the scale ($M = 3.33$; $SD = 1.39$).

Association between conspiracist ideation and anthropomorphisation.

The correlation between mean GCB scores and mean IDAQ scores was moderate and positive ($r(81) = .39$, $p < .001$). That is, people who endorsed generic conspiracist ideas more strongly tended also to endorse anthropomorphic statements more strongly.

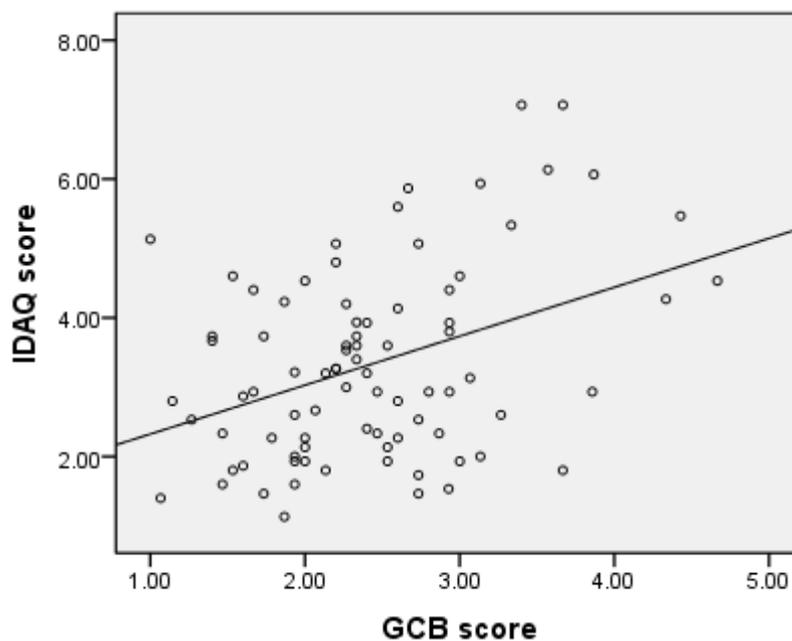


Figure 4.5. Scatterplot of anthropomorphism (IDAQ scores) scores against conspiracist ideation (GCB scores).

Discussion

The aim of the present study was to replicate previous research indicating a relationship between individual differences in anthropomorphisation and conspiracist ideation (Bruder et al., 2013; Imhoff & Bruder, 2013). The data support the relationship; a modestly sized positive correlation was found, with stronger endorsement of conspiracy theories associated with greater anthropomorphism. Together with the findings of Study 5c, this appears to add further support to the notion guiding this chapter – that conspiracist ideation is associated with promiscuous inferences of intentionality. However, the inter-relationship between the constructs of anthropomorphism and intentionality biases must be established to be sure that anthropomorphism represents a product of the bias towards inferences of intentionality. The next study was conducted to examine anthropomorphism and intentionality inferences in conjunction.

Study 8: Associations between anthropomorphisation and intentional inferences

Having gathered tentative evidence of relationships between conspiracist ideation and a bias towards inferences of intentionality (Study 5c), as well as anthropomorphism (Study 7), the current study aimed to replicate these relationships using an independent sample. Further, the study aimed to explore the inter-relationship between intentionality inferences and anthropomorphism. This chapter is guided by the supposition that a proclivity towards overattribution of intentionality in general, as a result of failure to overcome the intentionality bias, promotes acceptance of conspiracy theories. The current study aims to examine whether anthropomorphisation is another product of the same bias; that is, inferring nonhuman intentionality may simply be an extension of biased judgements of intentionality concerning other humans. If that is the case, then anthropomorphism and biased intentionality inferences should be positively related, and the association between anthropomorphism and conspiracism ought to be mediated by biased inferences of intentionality.

Method

Participants. Study 5c suggested that the ambiguous sentences task is sensitive to participants' interpretation of the task instructions. With this in mind, the current study solicited data only from participants whose first language was English.

Eighty-six psychology students (74.4% female), ranging from A-Level (55.8%) through to Postgraduate level (16.3%), completed the study in return for entry into a prize draw for a £15 gift voucher. Participants were aged between 16 and 58 years ($M = 23.5$, $SD = 9.7$), and the majority indicated British or Irish nationality (90.7%).

Design. A correlational design was employed. The variables of interest were individual differences in conspiracist ideation, anthropomorphism, and intentional inferences.

Materials.

Generic Conspiracist Beliefs scale. General conspiracist beliefs were again assessed using the measure of generic conspiracist ideation described in Chapter 2 of this thesis. Cronbach's alpha for the scale was high ($\alpha = .92$).

Individual Differences in Anthropomorphism Questionnaire (IDAQ: Waytz et al., 2010). Anthropomorphism was assessed using the 15-item IDAQ (example item: "To what extent does a television set experience emotions?"). Internal reliability in the current study was high ($\alpha = .90$).

Individual differences in intentional inferences (Rosset, 2008). The 12 ambiguous sentences used in Study 5c to measure individual differences in bias towards intentional inferences were used again in the current study. The general procedure and instructions remained the same. However, minor modifications were made to reflect the web-based interface, and to avoid the problem of ambiguous responses encountered in Study 5c.

First, an initial web-page presented the 12 sentences in randomised order. Each sentence was accompanied by a small text input field in which participants were asked to type a brief description of the image that came to mind when reading the sentence. On completing this phase of the task, participants clicked a button to move on to a new page, which reiterated the 12 sentences together with the descriptions the participant had entered for each. Participants were instructed, "We're now going to remind you of the sentences you just read and the answers that you provided. For each of the answers you gave, all we would like you to do is clarify whether the event or action that you imagined was done on purpose or by accident." To do so, participants selected the appropriate option from a list of options labelled 'on purpose' and 'by accident'. Unlike in Study 5c, in the current study a 'not sure / cannot decide' option was also provided. This additional response option was included so that participants were not forced to choose one of the former options

if they felt unsure of their response, or of the task instructions. ‘Not sure’ responses were excluded from analyses, avoiding the potential introduction of experimenter subjectivity in identifying or coding ambiguous items.

Demographics. Participants were asked to indicate their age, level of study, nationality, and whether English is their first language (data from non-native-English-speakers were discarded).

Procedure. The survey was administered via a computer-based interface. Some participants (approximately one-third of the sample) were tested in person using computer facilities at Goldsmiths, University of London. The remaining participants were recruited using emailed volunteer requests directed to current A-Level and Postgraduate psychology students, with participants completing the study remotely by accessing the survey online. To avoid priming ideas of conspiracy theories, the word ‘conspiracy’ was not mentioned in the information sheet presented to participants prior to filling in the questionnaire. No time limit was given, though participants were asked to work quickly, answering with their first instincts.

Results

Data screening and descriptives. No cases were missing data for more than two items on the GCB, IDAQ, or intentional inferences measures; thus, none were excluded. No multivariate outliers were identified.

A mean GCB score was calculated for each participant. Scores were approximately normally distributed. On the whole, participants demonstrated slight scepticism towards conspiracist ideas ($M = 2.71$, $SD = 0.86$). Males and females did not differ in terms of conspiracist ideation ($t(83) = 0.76$, $p = .45$, $d = 0.17$). There was no significant correlation between conspiracist ideation and age ($r(84) = -.19$, $p = .09$).

In addition, a mean IDAQ score was calculated for each participant. Scores showed slight positive skew (skewness = 0.42). Participants were generally somewhat disinclined to anthropomorphise, evident from a grand mean slightly below the mid-point of the scale ($M = 3.54$, $SD = 1.55$).

Finally, an intentionality score was calculated for each participant by summing the number of intentional inferences made in response to the 12 ambiguous sentences. Where participants were missing an item or had selected the ‘not sure’ response option for an item their total was adjusted by dividing the number of

intentional attributions by the total number of valid items and multiplying by 12, to give a score comparable to participants with valid data for all 12 items. Again, participants generally interpreted significantly more than half ($M = 7.75$, $SD = 2.41$) of the ambiguous sentences as being intentional actions ($t(85) = 6.70$, $p < .001$, $d = 0.65$). The data were approximately normally distributed about the mean, with scores ranging from 1 to 12.

Associations between conspiracist ideation, anthropomorphisation, and intentionality inferences. There was no significant association between intentional inferences and anthropomorphism ($r(84) = -.10$, $p = .37$); participants who indicated higher levels of anthropomorphism were no more likely to interpret the ambiguous sentences as intentional.

To examine the relationships between these two variables and conspiracist ideation, a multiple regression analysis was conducted with anthropomorphism and intentional inferences as predictors and GCB scores as the criterion. Overall, the model was significant and explained a considerable amount of variance ($F(2, 83) = 27.72$, $p < .001$, $\text{Adj. } R^2 = .39$). Both predictors contributed significantly to the model (see Table 4.1). The relationship between intentional inferences and conspiracist ideation was positive and weak, while the relationship between anthropomorphism and conspiracist ideation was positive and more substantial.

Table 4.1. *Results of multiple regression with intentional inferences and anthropomorphism predicting conspiracist ideation.*

Predictor	β	t	p
Anthropomorphism	.62	7.29	< .001
Intentional inferences	.19	2.22	< .05

Discussion

This study aimed to investigate the inter-relationships between conspiracist ideation, individual differences in anthropomorphism, and bias towards inferences of intentionality. Contrary to expectations, no association was found between individual differences in anthropomorphism and biased intentionality inferences. Individuals who offered a greater number of intentional interpretations in response to imagined ambiguous scenarios were not more inclined towards anthropomorphism. Conversely, individuals relatively low in trait-anthropomorphism were not more

likely to interpret the ambiguous scenarios as accidental. The absence of a direct relationship between anthropomorphism and biased inferences of intentionality suggests that anthropomorphism is not simply a product of biased inferences of intentionality. Rather, the two measures appear to reflect conceptually distinct traits.

Neither is the relationship between anthropomorphism and conspiracism mediated by biased intentionality inferences, or vice versa. Multiple regression analysis suggested that both traits independently predicted conspiracist ideation, with higher scores on both measures predicting stronger conspiracist ideation. The relationship between intentionality inferences and conspiracism was small, only verging on statistical significance. However, the successful replication and comparable effect size to that observed in Study 5c suggest that the relationship, while small, is reliable. The relationship between anthropomorphism and conspiracism, on the other hand, was stronger. The magnitude of the relationship is consistent with Study 7, as well as previous research (Bruder et al., 2013; Imhoff & Bruder, 2013), again suggesting that this relationship is reliable.

Given the lack of association between biased intentionality judgements and anthropomorphism, and the independent predictive value of each in regards to conspiracist ideation, it appears that anthropomorphism, as measured in the current study, reflects something other than a general preference for attributions of intentionality. One possibility is that, rather than invoking low-level processes relevant to judgements of intentionality, anthropomorphisation (or at least explicit endorsement of anthropomorphic statements) is more closely related to general trait-openness, particularly towards certain kinds of New Age beliefs (Newheiser et al., 2011). This possibility is discussed in more detail in the *General discussion* section of the current chapter.

In sum, the findings of the current study provide additional support for the existence of an association between conspiracism and biased inferences of intentionality, as well as between conspiracism and anthropomorphisation. However, the latter relationship cannot be explained in terms of a general bias towards inferences of intentionality. This study is not equipped to fully elucidate the factors underlying these relationships, or the absence of a relationship between anthropomorphism and intentionality inferences. Further research is required to investigate what other cognitive or personality factors might influence these inter-relationships.

General discussion

This series of studies was guided by the speculation that the representativeness heuristic may serve to make claims postulating intentionality more plausible to individuals who are biased towards seeing intentionality as the primary cause of events in the world in general (see Imhoff & Bruder, 2013; Petrican & Burris, 2012; Rosset, 2008). Thus, it was hypothesised that conspiracy theories, which paint events almost exclusively as the product of the conspirators' intentions, may appear especially plausible to individuals who are prone to promiscuous attributions of intentionality. The findings of the four studies offer some support for this hypothesis, but suggest important caveats.

First, the findings of Studies 5c and 8 indicate an association between conspiracist ideation and *inferences* of intentionality – that is, attributions of intentionality in response to imagined ambiguous actions, such as “He set the house on fire.” Both studies revealed a small but seemingly reliable association, whereby individuals who are relatively more inclined to interpret ambiguous imagined actions as intentional are more likely to endorse generic conspiracist statements. Conversely, individuals more inclined to interpret ambiguous actions as accidental are more likely to reject conspiracist ideas. This is consistent with the speculated relationship between promiscuous attributions of intentionality and belief in conspiracy theories.

However, Study 6 suggests that the same is not true of *perceived* intentionality – that is, attributions of intentionality in response to observed actions. When bias towards perceiving an observed action as intended was measured by way of an ambiguous videos task, in which participants viewed a person performing an ambiguous movement, the number of intentional attributions a participant offered was not associated with their endorsement of conspiracist statements.

One potential explanation for these seemingly incongruous findings is that the relationship between attitudes towards conspiracy theories and judgements of intentionality is more nuanced than initially hypothesised. There may be crucial differences between perceptions and inferences of intentionality. While research to date has not explicitly addressed this possibility, there is some potentially relevant evidence suggesting that perceptions and inferences are dissociable when it comes to judgements of physical causality. Using stimuli which produce an illusion of physical causality (see Michotte, 1963), Schlottmann and Shanks (1992) report that

participants were able to correctly infer the true cause of a simple action; however, these inferences did not alter their perception of what caused the action. That is, factors which influence inferences of physical causality do not necessarily affect perceptions of what caused an action (see also Johnston, 2013).

These findings lend some plausibility to the speculation that inferences and perceptions of intentionality – a form of social causality – might also be dissociable. That is, factors which influence perceptions of intentionality may not influence inferences of intentionality, and vice versa. The current studies suggest that, while both perceptions and inferences of intentionality appear to be biased towards intentional attributions, only inferences were associated with elevated conspiracist ideation. Given that reasoning about conspiracies necessitates inferring the conspirators' actions and motives, rather than directly observing their behaviour⁶, it is perhaps unsurprising that, if inferences and perceptions of intentionality are dissociable, only the former would be associated with conspiracist beliefs.

Moreover, the measurement devices used in the current research may have accentuated any differences between inference and perception. The task of observing and reasoning about a simple finger movement (Study 6) offers few potential clues to base judgements upon. On the other hand, asking participants to imagine a more complex scenario, such as a person setting fire to a house (Studies 5c and 8), affords scope for more detailed speculation about the actor's potential motives. These speculations may be more susceptible to influence by the participant's prior views on the world, such as whether people's motives are generally malicious or benevolent, for example. With this in mind, perhaps the perceptual bias measured in Study 6 is relatively indiscriminate, and thus unrelated to other personality factors or abstract attitudes, while the inferential bias measured in Studies 5c and 8 is more open to influence by confounding factors.

In this way, the relationship between conspiracism and inferences of intentionality may not be as simple as this chapter initially hypothesised. Rather than simply reflecting an automatic representativeness heuristic, the relationship between inferences of intentionality and conspiracism may be mediated by other

⁶ Though the *consequences* of their actions may be observed. For instance, the collapse of World Trade Center buildings 1, 2, and 7 was broadcast on live television news, and has since been viewed by millions of people via video recordings. However, the postulated conspiratorial behaviour which brought about those consequences can, by definition, not have been observed by anyone not involved in the conspiracy. Thus, the actual behaviour of the alleged conspirators must be imagined.

psychological variables. However, this postulated dissociation between perception and inferences is meant only as a tentative conjecture meant to guide future research, rather than to definitively explain the current findings. The current studies do not allow this hypothesis to be either confirmed or rejected.

Another possibility is that the measure of biased perceptions of intentionality employed by Study 6 simply failed to produce a valid assessment of individual differences in preference for intentional explanations. Moreover, the power of the statistical analyses may have been reduced by the sample, which was somewhat skewed towards disbelief in conspiracy theories. To investigate these possibilities, future research must first assess perceived and inferred intentionality in conjunction. If the two are truly dissociable, then the measures should not correlate, and should predict different outcomes. Going further, research may aim to study intentionality inferences in conjunction with other potentially relevant motivational, personality, or situational factors in order to reveal any moderating or mediating variables. To take one example, research suggests that the motivation to seek forms of compensatory control may influence judgements of intentionality (Kay et al., 2010, 2009; Whitson & Galinsky, 2008).

Looking beyond the measures of inferred and perceived intentionality, Study 7 found evidence that individuals relatively high in trait-anthropomorphism are more likely to entertain conspiracy theories. This is consistent with previous studies, which have found a similarly sized moderate correlation (Bruder et al., 2013; Imhoff & Bruder, 2013). It was initially speculated that this may be a result of anthropomorphism merely reflecting another product of the bias towards inferences of intentionality. However, Study 8, which looked at the two measures in conjunction, found no evidence of a relationship between the measures of anthropomorphism and biased inferences of intentionality. Both traits independently predicted conspiracist ideation. Thus, anthropomorphism cannot be explained as a product of biased inferences of intentionality.

One potential explanation for this is that anthropomorphism, as measured in the current studies, reflects an individual's broad attitude towards the world and people's place in it, as opposed to reflecting a low-level bias towards seeking intentionality. Previous studies have found conspiracism to correlate with traits reflecting openness to unusual ideas (Darwin et al., 2011; Swami et al., 2011, 2013). In particular, one study reports an association between conspiracism and

endorsement of New Age ideas (Newheiser et al., 2011). There is some possible conceptual overlap between measures of New Age beliefs and anthropomorphism. The IDAQ (Waytz et al., 2010), used in the current research, asks “To what extent does the wind have intentions,” for example. Participants may interpret this as reflecting the same sentiment as some New Age beliefs, such as “The whole cosmos is an unbroken living whole...” (Newheiser et al., 2011, p. 1009). Future research may examine anthropomorphism in conjunction with a variety of other beliefs, such as New Age beliefs and religiosity, in order to establish the inter-relationships between these belief systems.

In considering the limitations of the current research, it is important to note the size of the reported relationships. The association between anthropomorphism and conspiracism was reasonably strong (Studies 7 and 8). However, the relationship between conspiracism and biased inferences of intentionality, at least using the ambiguous sentences task adapted from Rosset (2008), was small (Studies 5c and 8). Both effects only bordered on the traditional statistical significance criterion of $p < .05$. However, the fact that the effect was replicated using an independent sample suggests that it is reliable.

Even if the relationship is reliable, however, the question of whether it is meaningful remains. Comparing the strongest believers with the strongest nonbelievers, Study 5c found a difference of just over 1 item out of 12 on the ambiguous sentences task. The effect size observed in Study 8 was of a similar magnitude. This would seem to indicate that biases in inferring intentionality play a role in conspiracist ideation, but perhaps not a prominent role. Indeed, the current findings indicate that the relationship might be relatively less meaningful when considering only people who fall in the middle of the normal distribution, somewhere between mild scepticism and mild acceptance of conspiracy theories. Study 5c showed that the middle two quartiles of the sample did not differ substantially in the likelihood of intentional attributions. The difference was only meaningful when comparing the subset of the sample at the extreme ends of the bell-curve – those who profess stronger belief or disbelief. Yet, it must be borne in mind that the measure of biased inferences employed in the current research merely presented 12 opportunities to infer intent. Daily life, on the other hand, presents many opportunities to infer intentionality on a daily basis. Thus, if the observed bias pervades reasoning about all ambiguous imagined actions, then even a small bias could amount to an important

difference. Further research using more sensitive measures of intentionality biases is recommended.

A final significant limitation of the current research is that it is entirely correlational, and therefore cannot establish the causal direction of the relationships. This chapter was based on the speculation that a domain-general bias towards attributions of intentionality causes conspiracy theories to be evaluated more positively, due to the representativeness heuristic making explanations which offer the most intendedness appear especially plausible. This seems a reasonable speculation, given evidence that the intentionality bias is a low-level, intrinsic aspect of the cognitive system (Kelemen & Rosset, 2009; Rosset, 2008). However, the current research does not demonstrate this causal relationship; it merely demonstrates an association between an inferential bias and conspiracist ideation. An alternative possibility is that believing that the world is dominated by conspiracy primes an individual to evaluate any imagined scenario, even outside the context of conspiracy, in terms of intentional agency. Only research taking an experimental approach can establish the direction of causality. Future research may seek to establish whether manipulating the intentionality bias, perhaps via cognitive load (see Bègue et al., 2010; Kelemen & Rosset, 2009; Rosset, 2008), has a direct effect on endorsement of conspiracy theories.

Summary and conclusions

The studies reported in this chapter provide qualified support for the hypothesis that endorsement of conspiracy theories is associated with promiscuous attributions of intentionality. While biased attributions based on perceived actions did not correlate with conspiracism, biased attributions based on inferred actions did reliably correlate with conspiracism in two studies. Anthropomorphism, too, was found to reliably correlate with conspiracist ideation; however, anthropomorphism does not appear to simply reflect the same bias towards intentional attributions. Together with the results of Study 5b, as well as several prior studies (Douglas & Sutton, 2011; LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; McHoskey, 1995; Whitson & Galinsky, 2008), the current studies provide further evidence for the role of cognitive biases – particularly the representativeness heuristic – in the formation or maintenance of conspiracist beliefs. It would be premature and reductive to say that endorsement of conspiracy theories is driven primarily by low-

level cognitive biases or heuristics. However, this research suggests that such biases may play a small role in making conspiracy theories appear more plausible. In this way, conspiracy theorising may not be a deviation from normal thinking, but rather an inevitable byproduct of normal cognitive processes.

Chapter 5

General Discussion

Purposes and key findings of the present research

Background and rationale

Much of the contemporary academic literature on the phenomenon of conspiracy theorising stems from Hofstadter (1964). In a seminal essay, Hofstadter describes the key features of what he refers to as ‘the paranoid style in American politics’. He argues that this is a style of thinking specific to fringe movements, and characterised by extreme paranoia, delusional thinking, “heated exaggeration, suspiciousness, and conspiratorial fantasy” (p. 77). Much of the ensuing academic literature emanated from the fields of sociology and, more recently, social psychology. Inspired by Hofstadter (1964), this work largely views endorsement of conspiracy theories as a product of social and motivational factors, assuming conspiracist ideation to be limited to a relatively small number of people on the margins of respectable society.

According to this view, conspiracism results from an imbalance of social power and lack of knowledge or understanding. Individuals or groups who feel ostracised or persecuted by mainstream society, or find themselves unable to exercise political influence or achieve personal goals, may be drawn towards conspiracy theories as a means of rationalising their circumstances, maintaining self-esteem, fostering in-group solidarity, and expressing negative sentiment towards out-groups (see Bartlett & Miller, 2010; Swami & Furnham, 2014). In this way, conspiracism reflects an attempt to make sense of the complex and chaotic reality of everyday life. By offering disenfranchised individuals the potential to identify and personify the source of otherwise inexplicable and troubling events, conspiracy theories might appeal to powerful psychological needs, negating the aversive feelings which can accompany powerlessness and lack of comprehension (Sunstein & Vermeule, 2009).

These ideas are supported by empirical data. As the literature review in Chapter 1 detailed, conspiracy theories appear to be endorsed more strongly by racial minorities, suggesting that such theories can help members of disadvantaged populations to make sense of their marginalised position in society (e.g. Abalaki-

Paap et al., 1999; Goertzel, 1994; Stempel et al., 2007). Likewise, correlational and experimental findings demonstrate that people experiencing diminished self-efficacy may entertain conspiracy theories in order to restore their sense of understanding and control (e.g. Abalakina-Paap et al., 1999; Grzesiak-Feldman, 2013; Whitson & Galinsky, 2008).

Thus, Hofstadter's (1964) treatise on conspiracy theories, and the ensuing sociological and social psychological research (see Swami & Furnham, 2014), has doubtless elucidated many important facets of conspiracism. However, as Walker (2013) points out, this conception of conspiracy theories fails to grasp the scale of the phenomenon. Far from being the purview only of a small handful of powerless, delusional paranoiacs on the margins of society, conspiracy theories are a mainstream pursuit. While those on the outskirts of respectable society do engage in conspiracy theorising, just as often it is those in the relative position of power and privilege who cast allegations of conspiracy against those around them. Likewise, conspiracy theories are prevalent not only during times of social inequality and hardship, but also during times of relative comfort and equality (see Walker, 2013). Consistent with this, surveys show that substantial numbers of people endorse various conspiracy theories, amounting in some cases, such as in relation to the assassination of President Kennedy, to the majority of the population (Goertzel, 1994).

The ubiquity and pervasiveness of conspiracy theories suggests that they cannot be explained solely as a result of social inequality, powerlessness, and the desire to rationalise adversity (though these factors doubtless play a role in some conspiracist beliefs). Rather, the genesis of conspiracism may lie in more universal aspects of human cognition. Theories about conspiracies may be plausible and appealing to so many people, both as potential explanations for real world events and simply as entertaining narratives in mainstream fiction (Knight, 2000), because they resonate with cognitive biases and illusions to which everyone is susceptible.

Given the relative dearth of psychological research investigating this question, it was this possibility that the current thesis aimed to investigate. The few studies which have broached this hypothesis to date provide preliminary support for the role of cognitive biases in conspiracist ideation. As detailed in Chapter 1, proportionality (Leman & Cinnirella, 2007; LeBoeuf & Norton, 2012; McCauley & Jacques, 1979), projection (Douglas & Sutton, 2011), pattern recognition (Whitson &

Galinsky, 2008), and confirmation biases (McHoskey, 1995) have all been demonstrated to aid in the formation or maintenance of conspiracist beliefs.

Aiming to extend upon these findings, and given the conceptual overlap between conspiracy theories and other anomalous beliefs, such as supernatural, pseudoscientific, and religious beliefs, the present thesis elected to take prior research into anomalous beliefs as a starting point. In particular, research suggests that one cognitive factor underlying some anomalous beliefs is the *representativeness heuristic* (Gilovich & Savitsky, 2002). The representativeness heuristic is an automatic cognitive rule of thumb whereby it is assumed that ‘like causes like’. This can result in a number of distinct systematic biases. One such bias is the proportionality bias, referring to the assumption that significant events have proportionally significant causes (see Ebel-Lam et al., 2010; LeBoeuf & Norton, 2012; Spina et al., 2010). A second bias is known as the conjunction fallacy, referring to the misperception that the co-occurrence of two events is more probable than either event occurring alone (Fisk, 2004). Finally, representativeness may cause intentional explanations for ambiguous events to appear more plausible than nonintentional explanations (see Kelemen & Rosset, 2009; Kelemen, 2004), due to the intentionality bias (Rosset, 2008).

Evidence indicates that each of these biases may make supernatural explanations appear more plausible than naturalistic explanations in certain circumstances or for certain people, particularly for events of large magnitude, conjunctive events, and explanations invoking supernatural intentionality (Gilovich & Savitsky, 2002; Kelemen & Rosset, 2009; Kelemen, 2004; Lupfer & Layman, 1996; Rogers et al., 2009, 2011). As noted, a small amount of research indicates that the proportionality bias may play a similar role in reasoning about the existence of conspiracies; conspiracy theories pertain to events of large magnitude, offering a proportionally large, and thus intuitively plausible, causal attribution (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007). Given that conspiracy theories concern conjunctive events and postulate intentional agency as a primary cause, there is reason to suspect that the conjunction fallacy and biases concerning attributions of intentionality may also play a role in the adoption of conspiracist beliefs. With this in mind, Chapters 3 and 4 aimed to provide a systematic investigation of the role of the representativeness heuristic and several of its resultant biases in conspiracist ideation.

Before embarking upon this series of studies, however, it was necessary to explore the issue of measuring belief in conspiracy theories. Several scales measuring conspiracist ideation exist in the literature; however, the various measures entail several practical and theoretical limitations. The item selection process for existing measures has been seemingly arbitrary and, with only one recent exception (Bruder et al., 2013), no measure has been subjected to the extensive psychometric validation required of psychological measurement devices. Further, no measure has been adopted by researchers other than its creators. Moreover, most existing measures take the approach of assessing endorsement of a small selection of specific event-based conspiracy theories, such as the death of President John F. Kennedy and the 9/11 terrorist attacks. This approach compromises content validity and potentially restricts the practical utility of such scales to certain geopolitical or temporal contexts where the chosen theories are culturally relevant. With this in mind, the series of studies reported in Chapter 2 aimed to design and validate a novel measure which would be suitable for use in a wide range of empirical contexts, including the subsequent studies in this thesis. Importantly, this novel measure was designed to assess *generic* conspiracist ideation – that is, endorsement of non-event-based conspiracist statements – thereby providing a measure of more practical utility than existing measures.

Key findings

In total, the studies reported in Chapter 2 suggest that the newly created Generic Conspiracist Beliefs (GCB) scale is a valid and useful measure of conspiracist ideation. Study 1 detailed the process of item selection. A large pool of generic conspiracist items was created, designed to reflect a wide variety of conspiracy theories. Crucially, however, each item was removed from the context of any specific real-world events or entities by using generic descriptors such as “certain events” and “the government”. Exploratory factor analysis (EFA) indicated that negatively worded items functioned differently from positively worded items. Following elimination of negatively worded items, EFA revealed five conceptually meaningful factors, thought to reflect the key generic assumptions which underlie beliefs in specific conspiracy theories. These factors were labelled Government Malfeasance, Malevolent Global, Extraterrestrial Cover-up, Personal Well-being, and

Control of Information. On the basis of these findings, the final 15-item GCB scale was created, with 3 items referring to each of the identified factors.

Three subsequent studies provide evidence for the psychometric validity of the scale. First, Study 2 demonstrated that GCB scores reliably predict endorsement of specific event-based conspiracy theories, including a novel theory. In addition, this study showed that GCB scores are longitudinally reliable over an interval of five weeks. Study 3 demonstrated that the GCB possesses convergent validity. Consistent with previous findings (e.g. Darwin et al., 2011; Goertzel, 1994), GCB scores were associated with distrust, anomie, delusional ideation, and belief in the paranormal. Finally, Study 4 demonstrated that the GCB possesses discriminant validity. As expected, GCB scores were not associated with Sensation Seeking, Emotional Intelligence, or the Big-5 personality facets of extraversion and neuroticism. Prior evidence regarding an association between conspiracism and the Big-5 facets of openness and agreeableness is somewhat mixed (see Imhoff & Bruder, 2013; Swami et al., 2010, 2013); the current research did not find a relationship between these traits. A small relationship was found between conspiracist ideation and conscientiousness; in total, however, the findings demonstrate that conspiracist ideation cannot be explained purely in terms of the Big-5 or the other traits examined in this study.

Chapters 3 and 4 present the first use of the GCB to examine the relationships between conspiracist ideation and cognitive biases, specifically focusing on the representativeness heuristic. Together, the studies reported in Chapters 3 and 4 provide mixed evidence regarding three representativeness biases – the proportionality bias, the conjunction fallacy, and bias towards attributions of intentionality.

First, Study 5a set out to extend upon previous research concerning the proportionality bias. Three previous studies have found that conspiratorial explanations are preferred for events of large magnitude, such as the successful assassination of a president (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007; McCauley & Jacques, 1979). These prior studies all employed dichotomous manipulations (small vs. large magnitude events). The present study extended upon this by adding a third (intermediate) magnitude condition. The number of deaths resulting from a fictional terrorist bombing constituted the magnitude manipulation. It was hypothesised that conspiracist attributions would be more likely as the

magnitude of the alleged death toll increased. Contrary to expectations, however, no proportionality effect was observed; the magnitude of the reported consequences had no effect on endorsement of conspiracist attributions. However, endorsement of conspiratorial explanations correlated with prior conspiracist ideation. While this does not support the proportionality hypothesis, it is consistent with previous research indicating that endorsement of a novel conspiracy theory is predicted by an individual's general level of conspiracist ideation (Swami et al., 2011). It is unclear whether these findings represent a failure of the current stimuli to evoke the proportionality bias, or genuinely cast doubt upon prior findings.

Study 5b centred on the conjunction fallacy. Previous research has shown individual differences in susceptibility to the conjunction fallacy to be associated with belief in the paranormal (Rogers et al., 2009, 2011). Given that conspiracist narratives depend upon conjunctive events being subsumed into a singular causal narrative, Study 5b aimed to examine whether susceptibility to the conjunction fallacy also correlates with belief in conspiracy theories. The results were consistent with this hypothesis. Conspiracy-believers made a greater number of conjunction errors, both for conspiracy-themed conjunction items, as well as neutral conjunction items. This suggests that susceptibility to the conjunction fallacy is domain general. Individuals generally susceptible to the fallacy may be more accepting of conspiracy theories because conspiracist explanations are representative of a world in which causally related conjunctive events are commonplace.

Finally, Chapter 4 presented a series of studies guided by the hypothesis that individuals who tend to interpret ambiguous events as having been brought about intentionally will view conspiracy theories as more representative, and thus more plausible, than nonconspiracist explanations. Support for this hypothesis was mixed. First, Study 5c found a small relationship whereby individuals who tend to *infer* intentionality when reasoning about imagined events tend to endorse conspiracy theories slightly more strongly. Second, however, Study 6 found that the same was not true of *perceived* intentionality; no relationship was found between participants' tendency to explain an ambiguous observed event as intentional and their degree of conspiracist ideation. These seemingly incompatible findings may reflect a dissociation between inferential and perceptual intentionality-seeking processes. As conspiracies must be imagined, rather than perceived, it is perhaps unsurprising that only biases in inferential processes are reliably associated with conspiracist ideation.

However, this potential explanation remains speculative. Further, Study 7 found an association between individual differences in anthropomorphism and conspiracist ideation, consistent with previous findings (Bruder et al., 2013; Imhoff & Bruder, 2013). However, Study 8 found that this relationship cannot be explained as a result of inferential intentionality biases causing both anthropomorphism and conspiracism. Rather, both anthropomorphism and biased inferences of intentionality appear to contribute independently towards conspiracist ideation.

Summary and implications

Measurement issues. The demonstration of content, criterion-related, convergent, and discriminant validity indicates that the GCB is at least as psychometrically valid as any existing measure. Together with one recently published similar scale (the CMQ: Bruder et al., 2013), the present findings prove that assessing generic conspiracist beliefs is a valid approach towards the measurement of conspiracist ideation. Further, the GCB is the only measure to date for which the entire item selection process, as well as psychometric validation, has been detailed in full. The practical advantages of taking a non-event-based assessment approach make the GCB a potentially preferable measurement device for researchers aiming to measure general conspiracist ideation, making the scale a valuable contribution to the literature on conspiracy theories.

In addition, the measurement aspect of the present thesis advances theoretical understanding of the structure of conspiracist ideation. Recent research suggested that beliefs in specific conspiracy theories of real-world events are the product of more generic assumptions about the world (Wood et al., 2012). The current findings offer a more detailed insight into the key assumptions which drive endorsement of specific conspiracy theories. Specifically, Study 1 identified five fundamental facets of conspiracism – belief that governments routinely conspire against their own people; belief that small groups of people secretly manipulate world events; belief that the existence of extraterrestrials is being covered up; belief that one's own health and liberty is threatened by conspiratorial activity; and belief that important knowledge in the public interest is suppressed out of self-interest. These facets are not intended to reflect distinct varieties of real-world conspiracy theory – many theories merge aspects of all five components. Rather, the five factors are argued to reflect five key intercorrelated assumptions about how the world works which

together constitute an individual's level of conspiracist ideation. These assumptions then influence judgments about events that take place in the world; the likelihood of an individual endorsing any specific conspiracist account is determined by the degree to which they accept these underlying generic conspiracist assumptions.

The data gathered using the GCB have potential implications for understanding of the prevalence of conspiracist ideation in the general population. The descriptive data for most studies in the current thesis indicate that generic conspiracist ideation is approximately normally distributed in the population, with an overall mean score just slightly below the mid-point of the scale. This indicates that, on average, people tend to be ambivalent towards the possible existence of grandiose conspiracies, neither strongly accepting nor strongly rejecting the possibility that insidious conspiratorial activity is routine. This is true of samples of university students, as well as the general public, suggesting that demographic characteristics and level of education matter little in determining an individual's proclivity to entertain conspiracy theories. Given that the majority of the population is inclined neither to uncritically accept nor outright dismiss the potential existence of grand conspiracies in general, it is perhaps unsurprising that popular opinion surveys find that large numbers of people express at least some degree of endorsement of many specific conspiracy theories, despite the fact that evidence in favour of the theories is, in many cases, scant (e.g. Birdwell & Littler, 2011; Gardiner & Thompson, 2012; Williams, 2013).

The role of cognitive biases. The current findings regarding the role of the representativeness heuristic are somewhat mixed, but supportive of certain representativeness biases playing a role in conspiracist ideation. To summarise the findings, susceptibility to the conjunction fallacy was associated with conspiracist ideation; biased inferences of intentionality were associated with conspiracism, but biased perceptions of intentionality were not; and the proportionality bias was not found to influence novel conspiracist attributions.

The positive findings regarding intentionality and the conjunction fallacy are correlational, and so cannot establish the direction of causality. However, given that such biases are thought to be low-level, automatic, and largely domain-general cognitive processes (Ebel-Lam et al., 2010; Fisk, 2004; Rogers et al., 2009), it seems reasonable to suggest a tentative causal explanation whereby the biases serve to make conspiracy theories appear more plausible. Specifically, it appears that there is

a small tendency for conspiracy theories to be considered more plausible by people who are more susceptible to the conjunction fallacy, and by those who are more biased towards inferring intentionality. It is unclear whether the failure to find a proportionality effect challenges previous findings (LeBoeuf & Norton, 2012; Leman & Cinnirella, 2007) or whether the current experimental design simply failed to evoke the bias. Further research is required to fully elucidate the precise conditions under which the representativeness heuristic and its resultant biases are evoked.

In total, the positive findings concerning the conjunction fallacy and biased attributions of intentionality tentatively imply that incorporating conspiracist ideation into the wider theoretical framework of anomalistic psychology is a promising approach. This framework may help to advance research into conspiracism by yielding productive hypotheses; the hypothesised links between conspiracism, the conjunction fallacy, and biased attributions of intentionality were novel predictions stemming from a theoretical framework in which conspiracist ideation is driven by the same underlying cognitive architecture that produces other anomalous beliefs (see French & Stone, 2014). The current research is not the first to suggest that conspiracy theories can be usefully conceptualised in terms of broader anomalistic beliefs. One recent article advocates a broader theoretical approach linking conspiracism and religiosity (Franks et al., 2013). However, the current thesis provides the first empirical evidence demonstrating that cognitive factors which may lead to paranormal, supernatural, or religious beliefs are also associated with beliefs in conspiracy theories.

These findings concerning the conceptual links between conspiracy theories and other anomalous beliefs perhaps go some way towards explaining the mixed findings concerning trait-openness which have emerged in the literature. Belief in conspiracy theories has been found to correlate reliably with superstitious, paranormal, and New Age beliefs (Darwin et al., 2011; Imhoff & Bruder, 2013; Newheiser et al., 2011; Stieger et al., 2013; Swami et al., 2011). There are some suggestions that these relationships may be mediated by general trait-openness towards new and unusual ideas (e.g. Swami et al., 2010). However, research examining correlations between conspiracist ideation and the Big-5 inventory has produced somewhat mixed findings, with some studies reporting a small relationship with openness and other studies failing to find the same link (Imhoff & Bruder, 2013; Swami et al., 2013, 2010). The current findings suggest that the relationship between

conspiracism and other anomalous beliefs is perhaps explicable not in terms of domain-general trait-openness as assessed by the Big-5, but primarily in terms of the operation of automatic, nonconscious biases which serve to make certain kinds of anomalous claim appear more plausible.

A broad perspective of cognitive biases suggests that being biased in certain systematic ways may be an evolved, adaptive trait (Haselton & Nettle, 2006). In evolutionary terms, the costs of being biased towards ‘false positives’ (the detection of meaningful patterns or threats where none exist) are often lesser than the costs ‘false negatives’ (failure to detect real patterns or threats). Seen in these terms, the current findings imply that conspiracy theories, together with other anomalous beliefs, may be a byproduct of how the human cognitive system evolved to reason about the world. The occasional detection of an imagined conspiracy may be one (usually relatively minor) cost of a cognitive system which is hypersensitive to potential threats and meaningful relationships. Boyer (2003) argues that religiosity may reflect “not a dramatic departure from, but a predictable byproduct of, ordinary cognitive function” (p. 119). The current findings suggest that the same may be said of conspiracy theories.

Research limitations

The research reported in this thesis is not without limitations. A primary limitation of the studies reported throughout this thesis concerns the representativeness of the participant samples, and thus the generalisability of the current findings. Due to the limited resources available to conduct the current research, it was not possible to randomly sample participants from the general population. In order to confidently generalise the current findings to the general population as a whole, it would be necessary to demonstrate that the participants who took part in the current research were representative of the wider population in all salient characteristics. However, some studies exclusively employed samples of university students. This is a common practice in psychological research, but one likely to lead to unrepresentative sampling. Other studies in the current thesis attempted to recruit a broader sample drawn from the general adult population. However, even in these cases, participants were ultimately self-selected, and various participant characteristics were not assessed.

Thus, it is not possible to say with certainty that the participant samples reflect the general population in terms of demographic characteristics such as race, ethnicity, level of education, socioeconomic status. Given that various studies have found that demographic characteristics such as these have little predicative power in respect to conspiracist ideation (Abalakina-Paap et al., 1999; Crocker et al., 1999; Darwin et al., 2011; Goertzel, 1994; Herek & Capitanio, 1994; Jolley & Douglas, 2013; Parsons et al., 1999; Simmons & Parsons, 2005; Stempel et al., 2007; Swami et al., 2010, 2011, 2013; Swami & Furnham, 2012), this could perhaps be considered a limitation of minor importance. Indeed, when age, gender, or nationality differences were examined in the current studies, differences were small or statistically nonsignificant.

Perhaps of more concern, it is not possible to say with certainty that the samples employed in the current research reflect the entire spectrum of variation in conspiracist ideation or familiarity with conspiracy theories. Concerning the studies which employed student samples, it is possible that university students differ from the general population in terms of conspiracist ideation. Moreover, several studies recruited self-selected participants via social media and emailing lists operated by psychologists engaged in anomalistic psychological research. It is possible that targeting individuals with an existing interest in anomalistic psychology introduced a bias among study participants towards disbelief in conspiracy theories. In order to counterbalance this potential bias, efforts were made in some studies to target recruitment messaging towards individuals potentially more sympathetic towards conspiracy theories, by posting messages on conspiracy theory web forums. However, whether because of biased recruitment messaging, biased self-selection responding, or a genuine bias towards disbelief in the population, disbelief was overrepresented within the current samples. This is likely to have weakened the statistical power of the studies to detect genuine relationships, and limits the generalisability of the findings.

A related limitation regards the meaningfulness of the findings presented in Chapters 3 and 4, concerning potential differences between ‘believers’ and ‘nonbelievers’. The majority of participants indicated either mild disbelief, uncertainty, or mild belief. The relative under-representation of participants at the two extremes of belief – especially the lack of strong believers – may have limited the power of statistical analyses. In the case of the conjunction fallacy, inferences of

intentionality, and anthropomorphism, small but significant linear correlations with conspiracist ideation were observed. However, linear trends analysis in Study 5c suggested that the relationships may be driven by differences primarily between individuals at the extreme ends of the samples – that is, those who indicate relatively strong belief or disbelief. Thus, the observed relationships not may serve to distinguish mild believers from mild sceptics; rather, the relationships may apply most meaningfully to distinguishing stronger believers from stronger nonbelievers. Given the relatively small number of participants who fell into these categories, it is possible that the relationships observed in the current research are spurious, resulting from a small and unrepresentative self-selected group of responders. Likewise, it is not possible to confidently state that the observed effect sizes are a true representation of the magnitude of effects, if they exist, in the general population.

Turning to methodological limitations of particular studies within the current thesis, a specific limitation of the research reported in Chapter 2, detailing the creation and validation of the GCB, is the lack of cross-cultural comparisons. A goal in creating the GCB was to produce a measure which, by referring to generic conspiracist assumptions rather than specific event-based conspiracy theories, would be suitable for cross-cultural use. To this end, the samples employed in Studies 1, 3, and 4 were composed of participants representing a range of nationalities and ethnicities. However, no specific efforts were made to target participants based on nationality or other demographic considerations, and no comparisons were made between nationalities or cultures. Moreover, the surveys were presented only in English, thus ruling out non-English speakers, and online, ruling out people without access to a computer and the Internet.

The extent to which this compromises the validity of the GCB is difficult to gauge. One previous study, focusing on beliefs in anti-Semitic conspiracy theories in Malaysia, indicates that endorsement of certain specific conspiracist claims may be influenced by cultural context (Swami, 2012). However, cultural issues may be of relatively minor importance when assessing generic conspiracist ideation. Since completion of the research described in Chapter 2, one study has been published describing the creation of a similar measure of generic conspiracist ideation (Bruder et al., 2013). Unlike the GCB, Bruder et al.'s Conspiracy Mentality Questionnaire (CMQ) was subjected to cross-cultural validation. Findings showed the CMQ to retain acceptable psychometric properties in English, German, and Turkish. One item

of the five-item scale appeared to function slightly differently in the Turkish sample; however, the measure appeared to retain validity on the whole. It remains to be established whether the GCB retains acceptable psychometric properties when used with non-English speaking, non-Western samples.

A significant methodological limitation of the program of research reported in Chapters 3 and 4 is that the stimuli used to assess or manipulate the various representativeness biases were novel, and thus have not been previously validated. The stimuli used to manipulate the proportionality bias in Study 5a were based on stimuli previously used by Leman and Cinnirella (2007); however, confounding variables may have been introduced by using the novel context of a terrorist bombing. In vignettes used in previous research, the scenario involved an assassination attempt which was either successful or unsuccessful. In the current vignettes, the ostensible terrorist attack was successful, in the sense that a bomb exploded in a crowded area, in all three vignettes; it is possible that the mere fact that a bomb exploded in a busy metropolis in all three scenarios overwhelmed any effect of the magnitude manipulation (the number of people killed by the explosion).

The measure employed to assess susceptibility to the conjunction fallacy was likewise based on a previously used measure (Rogers et al., 2009); yet, novel conspiracy-themed items were created for the purposes of the current research. It is possible that the conspiracy-themed conjunction scenarios differ from neutral conjunction items in unanticipated ways, perhaps by invoking judgements based on motivations, ethics, or morality, rather than more dispassionate reasoning by representativeness.

Likewise, the measures of biased attributions of intentionality used in Chapter 4 have not previously been used to measure individual differences in preference for intentional attributions. It is possible that the measure used in Studies 5c and 8, adapted from Rosset (2008), lacks the sensitivity required to assess individual differences in susceptibility to the intentionality bias. While more sentences were judged to be intentional than unintentional on the whole, this may reflect semantic biases in the way that words are typically used to convey an actor's intent; a sentence such as 'She kicked the dog' may be implicitly interpreted as conveying intention, regardless of a cognitive bias towards inferring intent. In this way, the observed relationship between conspiracist ideation and ratings of intentionality may reflect a third variable, such as reading comprehension or general intelligence, rather than

susceptibility to the intentionality bias itself. Likewise, the videos employed to assess bias towards perceiving intentionality in Study 6 may have contained some feature which prompted intentional attributions without invoking the intentionality bias; perhaps the finger-presses depicted in the videos were judged to be intentional more often than not simply because pressing a key on a keyboard is a prototypically intentional act. Thus, the psychometric properties of these measures warrant further investigation and validation.

A final methodological limitation is that, with the exception of Study 5a, the studies in the current thesis were correlational in design, and thus cannot establish the direction of causality. In the case of the intentionality bias, for example, it is not possible to say conclusively that a bias towards interpreting ambiguous events as intentional causes an individual to view conspiracy theories more favourably. The direction of causality may be the reverse; that is, a proclivity towards conspiracy theorising may lead an individual to infer intentionality more generally. Each study makes a theory-based argument for causality; however, it must be reiterated that the current findings are novel, and that these proposed mechanisms remain to be verified by future experimental research.

Future directions

Consideration of the limitations of the current research suggests some productive avenues for future research. First, concerning the cross-cultural validity of the GCB, it is essential to examine the psychometric and predictive properties of the GCB across a range of languages and cultures. Like much of the literature on conspiracy theories, research in the current thesis remained primarily exclusive to English-speaking participants of Western nationality. To establish cross-cultural validity, the GCB should be translated into a range of languages, and the psychometric properties compared across cultures. In particular, it may be of interest to examine differences across Western versus non-Western, and democratic versus nondemocratic cultures (see Bruder et al., 2013; Swami, 2012). Second, much of the present research addressing the role of cognitive biases was correlational. Speculative causal explanations were offered; yet, the possibility that conspiracist ideation shapes more general cognitive processing cannot be ruled out. Experimental research is required to elucidate and quantify the precise nature of these relationships.

In addition, the current findings suggest other general directions for future research. First, progressive research may consider taking a more nuanced view of conspiracism, going beyond a simple division between ‘believers’ and ‘nonbelievers’ as the current research, and much previous research, has used. The current findings tentatively suggest that certain variables may only meaningfully predict extremes of belief, rather than differentiating milder sceptics from mild believers. Thus, future research may make efforts to selectively recruit participants with stronger prior attitudes towards conspiracy theories – either strong belief or strong disbelief. Moreover, a useful taxonomy of ‘conspiracists’ may extend beyond simple degrees of belief. Bartlett and Miller (2011), for example, propose a more detailed categorisation of believers, differentiating between mere *consumers* of conspiracy theories, and *generators* of conspiracy theories. The current research focused primarily on conspiracy theories as they are consumed – that is, how individuals respond to existing conspiracy theories that they have been exposed to or have sought out. Future research may seek to compare the psychology of conspiracy-consumers with that of conspiracy-generators – that is, the people who formulate novel conspiracy theories. It is possible that the psychological factors which contribute towards endorsement of existing conspiracy theories are different from those which drive certain individuals to generate and spread novel theories.

The current thesis involved directly addressing conspiracist ideation via a self-report measure (the newly created GCB scale). This self-report methodology is a practically useful approach, and the findings indicate that the GCB is at least as valid as any existing measure. However, a productive approach for future research may be to address conspiracist ideation using indirect, implicit measures. The current findings suggest that conspiracist beliefs are, in part, a product of nonconscious biases and heuristics. In addition, previous studies show that mere exposure to conspiracist information can influence attitudes and behaviours (Butler et al., 1995; Jolley & Douglas, 2013; Swami et al., 2013), and that individuals may be entirely unaware of having been influenced (Douglas & Sutton, 2008). With this in mind, in addition to assessing explicit endorsement of particular conspiracy theories, it may prove useful to examine participants’ implicit attitudes towards conspiracies or the alleged perpetrators of conspiracies. It may be the case that even individuals who do not explicitly endorse a conspiracy theory are subtly influenced by its claims. Such an influence may be evident in participants’ implicit responses to the alleged

perpetrators or victims of the conspiracy, or in related behavioural intentions, such as intentions to vote for a political candidate, for example (see Bost, Prunier, & Piper, 2010; Jolley & Douglas, 2013).

Research has yet to broach the subject of how conspiracist beliefs may be effectively curtailed. The observation that a defining characteristic of conspiracy theories is the ability to accommodate disconfirming evidence (see Chapter 1), as well as the indication that conspiracist beliefs may be fuelled, in part, by sociocognitive biases, highlights the difficulties of combating these beliefs. However, the findings offer the possibility that conspiracist beliefs may be less likely to be adopted if the influence of these biases can be suppressed. One recent study (Leman & Cinnirella, 2013) took the approach of experimentally manipulating the need for cognitive closure (NFCC). Under normal conditions, participants tended to base judgements concerning a novel conspiracy theory primarily on their prior level of conspiracist ideation. However, when NFCC was decreased (by leading participants to believe they would have to defend their attitudes in front of a peer group), participants were more likely to be influenced by the available evidence relating to the potential conspiracy. Future research may take a similar approach to examine whether the influence of representativeness biases on conspiracism can be ameliorated by lowering NFCC or through other experimental manipulations (e.g. Agnoli & Krantz, 1989).

A more general point that must be considered as research progresses is that a solely psychological approach may be insufficient to fully understand conspiracism. This thesis, together with other psychological research, suggests that conspiracy theories may owe a degree of plausibility to the ways in which conspiracy theories mesh with low-level psychological biases, and the effects of certain personality traits or situational factors. Yet conspiracy theories are not merely isolated beliefs held by individuals. Conspiracy theories are ultimately shared beliefs; conspiracy theorising is a global, social, political, and historical phenomenon (see Byford, 2011). While the genesis of a conspiracist belief lies within each individual, in practice, conspiracy theories may take on new properties and functions. To date, pockets of research have emerged from within several disciplines – including philosophy (Coady, 2006; Graumann & Moscovici, 1987), sociology, anthropology, and cultural studies (e.g. Bratich, 2008; Knight, 2000, 2002; Pipes, 1998), history (e.g. Coward & Swann, 2004; Knight, 2003; Roisman, 2006; Walker, 2013), and psychology – yet there has

been little attempt to integrate the various insights. This is perhaps understandable, given that these efforts represent the first tentative steps towards understanding conspiracism. Research may not have yet reached the point where insights are developed enough to begin integrating different perspectives. Yet it seems fair to say that the phenomenon of conspiracy theories may be best understood by following an interdisciplinary approach informed by culture, politics, and history.

Conclusion

In sum, the present thesis has produced a novel measure of conspiracist ideation, broadly showing that assessing generic conspiracism is a valid approach towards the measurement of conspiracist ideation. In addition, the research shows conspiracist ideation to be, in part, a product of representativeness biases – specifically, susceptibility to the conjunction fallacy and a bias towards inferences of intentionality. It appears that individuals prone to these biases see conspiracist claims as more representative, and thus more plausible, than their nonconspiracist counterparts. In total, the findings suggest that, like other anomalistic beliefs, conspiracy theories may be in part a byproduct of normal cognitive processes. However, further research is necessary to establish the causal mechanisms underlying these relationships. Given the cultural relevance and potential harmful behavioural consequences of belief in conspiracy theories, both for individual believers and for the wider population, the factors underlying the formation, maintenance, and transmission of conspiracy theories are deserving of further scientific scrutiny. To date, conspiracy theories have been largely overlooked by psychologists. However, given the increasing number of publications on the topic in recent years, it appears that conspiracist ideation is at last receiving the attention it warrants.

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Appendix 2.1. *Item-loadings for the alternative 6-factor solution in Study 1.*

		Factor					
		1	2	3	4	5	6
2.	The government has employed people in secret to assassinate others	.83	.07	-.10	.03	-.20	-.04
48.	Government agencies have been secretly involved in the assassination of their own citizens	.82	-.03	.01	.08	-.19	.02
61.	The deaths of certain high-profile public figures have been the result of covert, government-sanctioned operations	.78	.04	.07	.03	-.21	.09
20.	Certain world leading political figures who died untimely deaths were in fact “taken out” by government operatives	.76	.05	.01	.02	-.11	.04
55.	Some of the people thought to be responsible for acts of terrorism were actually set up by those responsible	.74	-.03	.13	-.18	.14	-.08
19.	For strategic reasons, the government permits certain terrorist activities to occur which could otherwise be prevented	.70	.01	-.05	-.10	.21	.04
69.	Some acts of terrorism, which have resulted in the deaths of many civilians, have been secretly directed by government operatives	.67	-.11	.11	-.08	.05	.15
57.	High-level politicians have had certain people killed in order to prevent embarrassing events from becoming publicly known	.60	-.03	.01	.07	-.08	.18
38.	Government agencies secretly keep certain outspoken celebrities and citizens under constant surveillance	.60	.06	.02	.16	-.03	-.17
9.	Some individuals thought to be responsible for the assassination of public figures were set up by the group responsible	.60	.06	.06	-.06	.20	-.09
15.	The government lies about their knowledge of terrorist activities	.55	-.04	-.15	.26	.27	-.16
34.	The government keeps many important secrets from the public	.55	.09	-.06	.27	-.07	-.12
22.	There are ongoing, hidden efforts to marginalise, control or destroy certain groups of people through the use of political policies	.48	-.11	.11	.29	.03	.02
39.	The government deliberately permits certain terrorist activities to occur to keep the public in a state of fear	.47	-.02	.16	-.11	.33	.08
1.	Certain celebrities and/or public figures actually faked their own deaths in order to escape the spotlight	.43	.06	-.17	-.06	.13	.10
4.	The government has staged important societal events in order to manipulate voters	.39	-.04	.10	.14	-.07	.03
27.	Viruses and/or diseases have been deliberately disseminated to infect certain populations	.37	.02	-.03	.24	.06	.57
12.	The government fakes evidence relating to significant world events to deceive citizens	.33	.01	.12	.23	.16	.03
66.	Drugs are deliberately supplied to certain communities in order to marginalise or destroy them	.28	-.01	.25	.03	.17	.08
30.	Evidence of alien contact is being concealed from the public	.04	.95	-.05	.10	.01	-.16
53.	Evidence of alien presence on earth is being covered up	.02	.94	-.03	.06	-.03	-.04
25.	Secret organisations communicate with extra-terrestrials, but keep this fact from the public	..08	.90	-.06	-.03	-.07	.07
29.	Some UFO sightings and rumours are planned or staged in order to distract the public from real alien contact	.09	.78	-.02	.03	.02	.01
10.	Some existing technologies are the result of reverse engineering alien technology	-.03	.76	.02	.03	-.04	.13
37.	Space missions are deliberately sabotaged so that the public does not learn of existing alien activity in the solar system	.00	.61	-.05	-.17	.17	.16

Appendix 2.1. *Continued.*

	Factor					
	1	2	3	4	5	6
58. Movies and TV shows featuring aliens are a way of preparing the population for the news that aliens are real and have visited earth	-.13	.57	.30	-.06	.07	.06
59. The power held by heads of state is second to that of small unknown groups who really control world politics	.10	-.03	.94	-.02	-.03	-.09
42. A small, secret group of people is responsible for making all major world decisions, such as going to war	-.09	-.01	.91	.01	.09	-.05
70. Certain significant world events have been the result of the activity of a small group who secretly manipulate world politics	.17	-.04	.91	.02	-.22	.04
11. A small, secret group of people is actually in control of the world economy	-.11	.05	.88	.06	-.02	.01
68. Members of a secret group have infiltrated governments and powerful organisations in order to one day bring their group to the point of global control	.04	.04	.80	.00	-.06	.04
64. Many well-known celebrities, politicians and wealthy people are members of a secret society which has control over our lives	-.08	.07	.70	-.02	.04	.08
14. Large, influential industries are in fact tightly controlled by a small, secret group of people	.08	-.02	.66	.15	-.01	-.03
44. Small groups of people are in possession of secret knowledge which would change our understanding of the world, and are deliberately keeping it hidden	.09	.16	.39	.26	.02	.07
40. Secret organisations have access to large amounts of personal data on every citizen and sell it to the government	.21	.04	.30	.14	.21	-.13
52. New and better technology is suppressed by those whose current business would be disrupted by it	.23	.04	.11	.54	.02	-.08
28. New and advanced technology which would harm current industry is being suppressed	.20	.08	.01	.53	.05	-.02
65. Groups of scientists ensure that only evidence which supports a pre-determined conclusion is made known to the public	-.17	.02	.11	.52	.11	.23
21. Government funded scientists manipulate evidence in order to support existing government policy	.13	-.04	-.04	.51	.04	.27
72. Technology is being concealed which is far in advance of what is known to the general public	.06	.13	-.03	.48	.18	.09
71. Certain groups of scientists fabricate data in support of a particular scientific theory out of self-interest	.15	-.11	-.09	.47	-.11	.39
74. The media ensures that only certain information is made known to the public	.20	-.07	.08	.36	.23	-.05
17. The government has a large amount of confidential data on every citizen without their knowledge or permission	.10	.03	.19	.30	.10	-.11
60. Family planning policies are part of a plot to control and limit certain populations	.05	.00	.15	.19	.16	.18
18. Cures for certain deadly and common diseases exist, but are being deliberately withheld	-.09	.05	-.04	.15	.87	-.07
24. A lot of information about diseases and treatments is withheld from the public	-.02	-.10	-.05	.27	.84	-.07
8. The government withholds a lot of information about diseases and their treatments from the public	.02	.05	-.02	.15	.68	-.03
54. Progress towards a cure for cancer, AIDS and other diseases is deliberately being hindered	-.10	.09	.15	.16	.66	-.11
41. The pharmaceutical industry administers harmful treatments without people's consent in order to keep people sick and boost drug sales	.04	.13	.17	-.14	.45	.17

Appendix 2.1. *Continued.*

	Factor					
	1	2	3	4	5	6
50. The rapid spread of certain viruses and/or diseases is the result of the deliberate, concealed efforts of some organisation	.14	.06	.02	-.07	.42	.27
51. Some viruses and/or diseases which many people are infected with were created in laboratories as bio-weapons	.15	.09	.07	.06	.34	.11
33. Certain chemicals are put in the water supply in order to control the people	-.12	.18	.28	-.09	.33	.22
23. Technology with mind-control capacities exists and is currently being used on people without their knowledge	-.06	.10	.02	.10	-.10	.85
13. Technology with mind-control capacities is tested on people without their knowledge or consent	.05	.12	.10	.13	-.20	.73
46. Experiments involving advanced technologies are carried out on the general public without their knowledge or consent	.07	.06	.09	.09	.07	.51
36. Experiments involving new drugs are carried out on the general public without their knowledge or consent	-.03	.02	.09	.07	.29	.44
62. Advanced technology is secretly used to placate the people and suppress dissent	.06	.02	.22	.08	.11	.44
3. Groups of scientists deliberately attempt to create panic about future risks because it is in their interests to do so	.06	-.04	-.17	.31	.22	.40
7. Certain natural disasters have in fact been the result of secret testing of powerful and advanced technology with unknown capabilities	.10	.18	-.06	-.07	.26	.36
Unrotated Eigenvalues	27.5	3.43	1.33	1.25	1.04	0.73
% of variance accounted for following rotation	21.1	15.8	22.1	14.5	21.8	19.5

Note. N = 473.

Appendix 2.2. *GCB scale instructions and item wording.*

Beliefs About the World

There is often debate about whether or not the public is told the whole truth about various important issues. This brief survey is designed to assess your beliefs about some of these subjects. Please indicate the degree to which you believe each statement is likely to be true on the following scale: *Definitely not true; Probably not true; Not sure / cannot decide; Probably true; Definitely true.*

1. The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret
 2. The power held by heads of state is second to that of small unknown groups who really control world politics
 3. Secret organisations communicate with extraterrestrials, but keep this fact from the public
 4. The spread of certain viruses and/or diseases is the result of the deliberate, concealed efforts of some organisation
 5. Groups of scientists manipulate, fabricate, or suppress evidence in order to deceive the public
 6. The government permits or perpetrates acts of terrorism on its own soil, disguising its involvement
 7. A small, secret group of people is responsible for making all major world decisions, such as going to war
 8. Evidence of alien contact is being concealed from the public
 9. Technology with mind-control capacities is used on people without their knowledge
 10. New and advanced technology which would harm current industry is being suppressed
 11. The government uses people as patsies to hide its involvement in criminal activity
 12. Certain significant events have been the result of the activity of a small group who secretly manipulate world events
 13. Some UFO sightings and rumours are planned or staged in order to distract the public from real alien contact
 14. Experiments involving new drugs or technologies are routinely carried out on the public without their knowledge or consent
 15. A lot of important information is deliberately concealed from the public out of self-interest
-

Appendix 3.1. *Proportionality bias instructions and vignette wording.*

Instructions

Imagine that the following text has been transcribed from a real newspaper article. Some names and locations have been obscured. Please read the information carefully and use it to answer the questions which follow over the page.

Version 1: Small-magnitude condition

A large bomb exploded yesterday morning in the parking garage underneath the [REDACTED] building, a skyscraper in the financial district of [REDACTED]. *Nobody was* killed in the blast. Forensic investigators claim that the bomb was hidden inside a vehicle left in the parking garage and detonated remotely. *Officials expressed relief that, despite the extensive damage caused by the explosion, by pure luck no lives were lost.* Tenants of the 82-story office building mainly include multi-national financial firms and government agencies. So far police have revealed few details of their investigation into the bombing, but it is believed that a 35 year-old man, detained shortly after the explosion and suspected to be a religiously motivated terrorist, is currently being held in custody.

Version 2: Intermediate-magnitude condition

A large bomb exploded yesterday morning in the parking garage underneath the [REDACTED] building, a skyscraper in the financial district of [REDACTED]. *6 people were* killed in the blast. Forensic investigators claim that the bomb was hidden inside a vehicle left in the parking garage and detonated remotely. *The city is mourning the lives lost, however officials have expressed relief that more people were not harmed in the explosion.* Tenants of the 82-story office building mainly include multi-national financial firms, as well as government agencies. So far police have revealed few details of their investigation into the bombing, but it is believed that a 35 year-old man, detained shortly after the explosion and suspected to be a religiously motivated terrorist, is currently being held in custody.

Version 3: Large-magnitude condition

A large bomb exploded yesterday morning in the parking garage underneath the [REDACTED] building, a skyscraper in the financial district of [REDACTED]. *600 people were* killed in the blast. Forensic investigators claim that the bomb was hidden inside a vehicle left in the parking garage and detonated remotely. *The loss of life makes this the most destructive terrorist act on [REDACTED] soil.* Tenants of the 82-story office building mainly include multi-national financial firms, as well as government agencies. So far police have revealed few details of their investigation into the bombing, but it is believed that a 35 year-old man, detained shortly after the explosion and suspected to be a religiously motivated terrorist, is currently being held in custody.

Note. Wording intended to manipulate the magnitude of the event has been italicised. Italics were not included in materials presented to participants.

Appendix 3.2. *Wording of novel conspiracy-themed conjunction items.*

Jane suffers from a chronic illness. She asks her G.P. to prescribe her a particular medication which has recently been promoted by its manufacturer as a safe and effective treatment for her condition, though some scientists say the drug has serious side-effects.

- a) Jane starts to experience severe headaches.
- b) The manufacturer withdraws the medication from the market.
- c) Jane starts to experience severe headaches and the manufacturer withdraws the medication from the market.

Elaine has been having an affair with a high ranking politician. During an argument she threatened to reveal details of their affair to the media. A few days later Elaine is found dead, seemingly of a self-administered drug overdose.

- a) Details of the affair never get revealed to the public.
- b) The results of Elaine's autopsy mysteriously go missing.
- c) Details of the affair never get revealed to the public and the results of Elaine's autopsy mysteriously go missing.

Patrick works for a pharmaceutical company testing the efficacy and side-effects of the vaccines they manufacture. He discovers that one of their vaccines is associated with an increased risk of developmental disorders in children.

- a) Patrick's data get lost after an I.T. failure affecting his computer.
- b) Patrick is taken off the project.
- c) Patrick's data get lost after an I.T. failure affecting his computer and Patrick is taken off the project.

Ron is a well-known investigative journalist. While researching a story he finds evidence that various well-known politicians and celebrities are members of a secret society, and plans to reveal the information in a newspaper article.

- a) Several members of the secret society know about Ron's intentions to reveal his findings.
- b) Ron is fired from his job at the newspaper before publishing the article.
- c) Several members of the secret society know about Ron's intentions to reveal his findings and Ron is fired from his job at the newspaper before publishing the article.

Simon was travelling around rural America when he saw a strange light formation in the sky. Simon photographed the formation as it seemed to move in complex patterns for several minutes before appearing to vanish into the distance at extreme speed.

- a) There is a secret military base nearby.
- b) Shortly after seeing the lights Simon is approached by heavily armed military personnel and his camera is confiscated.
- c) There is a secret military base nearby and shortly after seeing the lights Simon is approached by heavily armed military personnel and his camera is confiscated.

Josh has a doctorate in engineering and has been inventing products and gadgets in his spare time for several years. After patenting a few unsuccessful products, Josh is now on the verge of perfecting a device which will increase the fuel efficiency of any car by 500%.

- a) The CEOs of several major petrol companies hold a meeting in which they discuss the implications of Josh's invention.
- b) Josh is found dead in his home before patenting the invention.
- c) The CEOs of several major petrol companies hold a meeting in which they discuss the implications of Josh's invention and Josh is found dead in his home before patenting the invention.

Jack is a scientist working on finding a cure for a highly infectious disease. Currently the only available treatment is a medication to manage the symptoms which must be taken daily; Jack's cure would make this medication obsolete.

- a) The existing medication is sold for a large profit.
- b) The laboratory where Jack works is destroyed in a fire.
- c) The existing medication is sold for a large profit and the laboratory where Jack works is destroyed in a fire.

Dave has been an administrator with a large company for five years. His job includes tracking other employees' email and internet usage. The company is promoting from within for a senior administration position. Dave is scheduled to have a meeting with his bosses to discuss whether he will get the position.

- a) Dave notices a lot of emails between a co-worker who shares his office and their bosses the day before his meeting.
- b) Dave does not get the promotion.
- c) Dave notices a lot of emails between a co-worker who shares his office and their bosses the day before his meeting and Dave does not get the promotion.